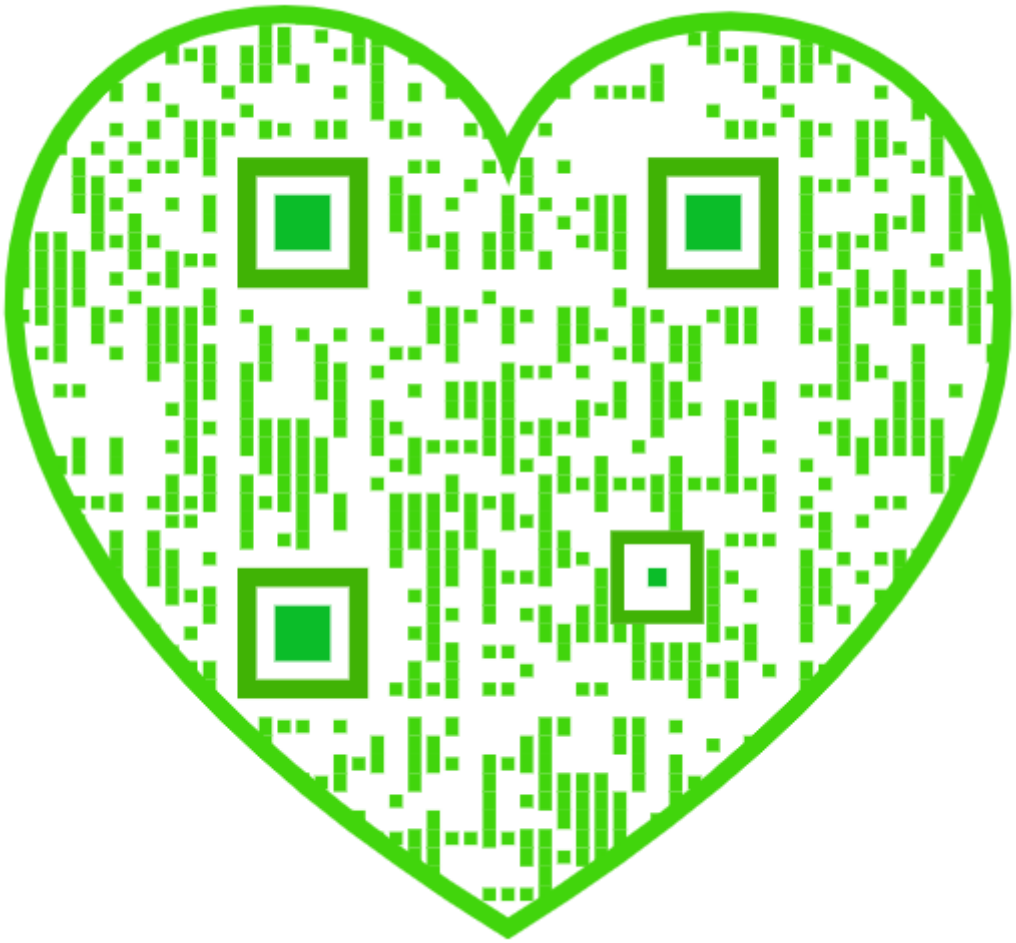
A
0011192598

Modern Letter Engraving.

Rees.

ifornia
onal
ity



BLVM
ENTH
EX AL LIB
RIS

You are cordially invited to inspect our selection of exclusive

Imported Suitings and Overcoatings for the coming season

F. Stern & Son
Merchant Tailor
Quincy, Illinois

We wish to express our sincere appreciation of your patronage the past years and wish you a happy and prosperous New Year.

Yours respectfully

Rockford Silver Plate Co.

MODERN

LETTER ENGRAVING

IN THEORY AND PRACTICE.

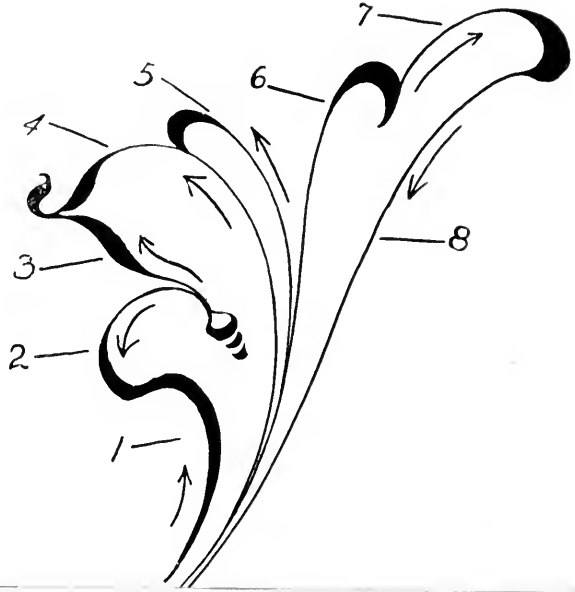
A MANUAL FOR THE
USE OF WATCHMAKERS, JEWELERS AND OTHER
METAL ENGRAVERS.

BY

FRED HOLMES REES.

ILLUSTRATED WITH NUMEROUS ETCHINGS BY THE AUTHOR.

CHICAGO:
GEO. K. HAZLITT & CO.


7
5
6
4
8
3
2
1

For filling in engraving on Metal.
Rogers Black Baking Japan, from Heath & Milligan 165 W Randolph St Chicago Ill.
bake for 2½ hr. in oven heated to 350° Fhr.
then store off the surplus.

SRLF
URL

PREFACE.

Cognizant of the fact there are many young men desirous of learning the art of letter engraving, who are unable to take a course of instructions under an instructor, and that there are many doing engraving by laboring under perplexing and discouraging disadvantages, and are unaware of it to some extent, owing to the lack of rudimentary and technical training and knowledge of the art, while if they had the advantages of being correctly informed and started in the right way, they would find the work an art and pleasant study.

For such reasons I was prompted to write this book.

THE AUTHOR.

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/modernletterengr00reesiala

MODERN LETTER ENGRAVING IN THEORY AND PRACTICE.

CHAPTER I.

Engraving as has well been said, is one of the most beautiful arts in existence, and there has been no time in its history for better opportunity to exemplify its beauty than during the past few years, in view of the fact of there having been so many novelties made and sold which are expressly designed to be engraved. The demand for engraving has increased so rapidly that it is impossible for jewelers to engrave the goods they sell during the busy seasons.

At this day and age, with the advancement in the art, it is necessary for those who would be successful, to be proficient and thorough. Proficiency is obtained only by persistent and studious work, by which the masters of the art have succeeded.

It is within the scope of any energetic young man's talents to become a good engraver without apprenticing himself to any regular instructor; however, the writer would recommend all students to both study books of instruction and spend as much time with a capable instructor as possible.

It is the object of this work to place before the student clearly and concisely as possible the best method of procedure, commencing at the foundation of the art and carefully considering each and every important

point connected with it, to its highest degree, avoiding misleading technicalities.

We first must learn what tools to use and how to use them, and the correct formation of letters, and how to cut them.

The student should supply himself with a text book, of different styles of letters and with a No. 3 hard pencil, and copy the script letters on paper until he can make them equivalent in form to the copy. It is obvious that we first learn to design the letters before any consideration of engraving them.

Zinc made into 3x4 inch sheets, is a good, cheap metal for the student to practice on, but as silver plates are much better and can be made cheaply, I would recommend them. Britannia metal plates can also be made by any silver plate manufacturer for forty cents per pound as the metal comes from the rolls, which is in good enough condition for engraving, and can be made any size and rolled to any desired thickness.

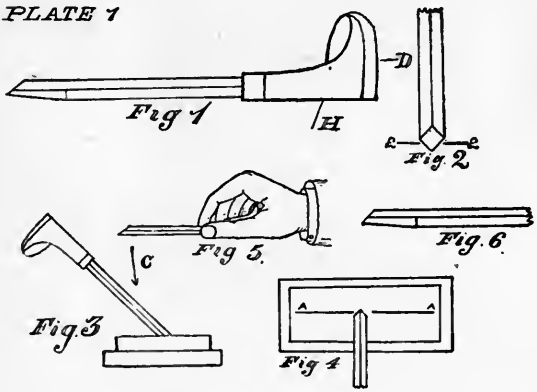
The next necessary thing is the graver, a sand bag pad upon which to hold the article to be engraved, and a rule; a thin one of celluloid or any flexible material about six inches long is the best style to use for plate work, and is also very useful on oval surfaces.

The best style of graver for the beginner to use is shown at Fig. 1, which is a square graver, fitted to handle; gravers are purchased separate from handles, and are tapering at the end that is intended to go into the handle

The selection of gravers is a very important item. After fitting the graver in handle, we break it off so as to leave it, including handle, not less than 4½ inches long.

In putting the blade in the handle, it should be so the maximum width of the graver is at the end of the handle, thus leaving the entire taper in the handle, which will give the graver the greatest strength at that point where it is most needed.

The graver should be so placed in the handle as to appear as shown at Fig. 1, and ground off on the end at an angle of 45 degrees, end view of which is shown at Fig. 2, when graver is laid flat as shown at Fig. 1



After breaking the graver off the desired length and grinding or whetting the end to an angle of 45 degrees, we then grind the under sides E, Fig 2, back about half an inch and on an angle as shown at Fig. 6.

The object in grinding the graver off in the manner above described, is to give a more convenient cutting angle, and enable us to hold the graver gracefully in our hand while executing the work.

The necessity of sharpening the graver as above described will be thoroughly understood by inspecting

Fig. 5, which shows the correct position to hold the graver. The graver is held between the thumb and index finger, with the back of the handle D, Fig. 1, placed in the palm of the hand, with the second finger around the right side of the blade, and the third and fourth or little finger on the flat side of the graver handle H, Fig. 1. It will be plainly seen that a graver held in this position, gives the operator perfect control of the tool.

If the graver were not ground on the under side as described, there would not be ample room for the operator's fingers between the plate and the handle.

Having ground the graver off on the under sides as above mentioned (the grinding is done on a grind stone or emery wheel) we next whet it on the under sides on a fine oil stone to remove the coarse scratches, left by the grinding process. To do this, place the index finger on the opposite or top side from the one to be whetted, pressing it down on the stone and merely steadying it with the thumb and second finger placed where the graver enters the handle and pushing it backward and forward, not from right to left.

Whetting the graver on the end, it is held in position as shown at Fig. 3, and moved from right to left on a straight line as shown at Fig. 4, which is a view of graver on stone looking in direction of arrow c Fig. 3. Great care should be used to whet the graver as above described, as if it is not moved on a line as mentioned, it is impossible to get the end flat. Should the graver be moved in a circular direction, which is the most natural and easy way, it would be rounding on the end, a thing most necessary to obviate.

CHAPTER II.

If you will now examine the cutting edges of the graver with an eye glass you will see a burr which must be removed; to do this, jab the graver in the end of a block of hard wood, which the pupil should have on his bench for this purpose.

The graver is now in order for cutting where a bright cut is not required, such as monograms on polished cases and watch caps. It is difficult to cut with the graver in this condition and at the same time the tool is sharper than it will be after it has been polished, but the effect of work cut with a graver as it comes from the stone is most beautiful, owing to the contrast between engraving and surface of article engraved. The cause of this effect will be well understood if you examine the cutting edges of your graver with a glass. This examination will reveal the fact that the edges referred to are like saw teeth or cutting edge of lining graver, caused by the scratches left by the oil stone.

If we have in hand a piece of work that we want to cut bright these scratches must be removed; the operation is generally understood by the student to be only polishing the undersides of graver, and he is apt to labor under the impression, if the graver in this particular part is polished, that is all that is required. This is an erroneous idea. We want to do as little polishing as possible, as the more polishing there is done just so much we destroy the sharp cutting edge and make the graver rounding. The graver should never be polished on the end.

To prove to the student that it is not necessary to polish the graver as above mentioned, I would state that many engravers polish their gravers on oil stones, the fact that it can be easily done will be thoroughly understood by subsequent instructions.

At D, Fig. 9, is shown a magnified view of the under or cutting side of a graver, as it comes from the oil stone, showing the lines previously referred to. It is obviously plain to any comprehensive mind that if we should draw the graver back from the point in the direction of the lines of Fig. 9 it would require much more polishing to remove the coarse scratches, than it would if we should place the graver on our emery block, which will be explained subsequently, in position shown at Fig. 8, which shows the graver in position for polishing the right underside. An appearance of graver after thus treated is shown at Fig. 7 which shows the lines left by emery block, but owing to the direction in which they run they do not cause any saw teeth appearance or rough edge.

It is well understood that all polishing materials contain particles that will scratch, even though they are so fine that we cannot detect them with the naked eye; this being the case it is plainly seen that if we do use fine polishing materials when polishing the graver, it would be impossible to put the graver in order for bright cutting by moving it or drawing it on the polishing block in direction of the lines at Fig. 9.

My object in dwelling so long on this subject is that there are so many engravers that have a wrong idea of this important part of their work, and such are to-day laboring under false impressions greatly to their disadvantage. I therefore wish to impress upon the student's

mind the importance of correctly putting the graver in order, which is an easy matter if one understands the correct manner of procedure.

What we want is a sharp-cutting edge, perfectly flat on under side, and on the end. A tool in this condition will not slip unless in the hands of a very unskillful operator.

To make the emery block above referred to (it is best

PLATE 2

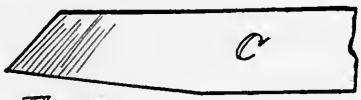


Fig. 7.

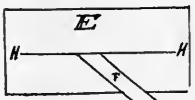


Fig. 8.

Fig. 9.

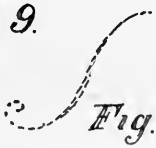


Fig. 10

to make two, as with the second we can finish the first, and it requires a very little more time to make two), get a piece of hard wood four inches long and one inch square, finished flat on all sides; now take a piece of oooo emery paper (which you can get at any material house), coat the back or paper side with mucilage, treating one side of the block in the same manner. Allow it to stand two or three minutes, then place the paper on

the block, turning the side that you have put the paper on down on some flat surface, and place a weight on the block, allowing it to remain until it is thoroughly dry, then saw the block in two in center, and you will have two blocks two inches long; you will notice by close examination that the paper is not perfectly flat; as all polishing blocks should be flat, we now rub the two blocks together, which will smooth them down dead flat. Now carefully trim the edges off, should any paper extend over the edges of the block, and you now have two of the best polishing blocks obtainable. I use and recommend this style of block as it is as fine as required to polish the graver, is convenient, durable, and will do the work quicker than any other that has come to my notice.

To polish the graver on the emery block above mentioned and described, place the tool on the block in position as shown at Fig. 8, where E represents the block and F the graver; place the index finger on the graver, very near the end, with thumb on left and under side, with the second and third finger on the right of graver to steady it. The position of thumb as mentioned will permit its use as a guide for moving the cutting edge of graver to be polished on a line with the edge of block, which line is shown at H H, Fig. 8. The graver must be moved in this direction to get a perfect polish. If the graver is held in the position and moved in the direction mentioned, it will not be necessary to draw it on the block more than an inch; should you find, however, that the graver will not cut a perfectly bright cut, repeat the operation.

Assuming that the student has strictly followed the instructions given, we now have our graver in perfect

order for cutting the connecting exercises and script lettering; and I wish to state at this time that there is no style of lettering more beautiful, or any that will give more general satisfaction than script letters when perfectly cut, and I trust that those who follow these instructions will master this style before any attempt is made to engrave other or more fancy letters. Before we consider the art of cutting the exercises or letters, we must first master the art of designing, a part of the engraver's work most essential to his success. Designing is not drawing letters as one would write, but is done by holding the pencil or designing point in the hand as you would when writing, and is done by making broken lines, as shown at Fig. 10. The object in making all designs in this manner is that by so doing we can easily correct our work as we advance. For illustration, if in making the "line of beauty," as shown at Fig. 10, we should notice that we were not making it as desired, we can easily change our course, as we only make or design a part of the letter at each stroke, and that portion where we have made the error can easily be detected and corrected. Designing should be done as lightly as possible; heavy or too much designing has a tendency to confuse the engraver. We are not supposed to make the letters perfect in detail by designing.

Only make the outlines as described by making the broken lines to guide the eye when engraving, but the outlines thus made must be made correct in form, angle, and size or height.

CHAPTER III.

The young men of today are so anxious to reach the summit of the profession they may decide to follow, that many rush forward in such haste to reach the top round of the ladder to success, that they step over many of the lower ones, and in this over estimation of their ability they fail to grasp the elevation desired, and having failed to place the lower rounds firmly they fall back into the overcrowded population of failure's domain.

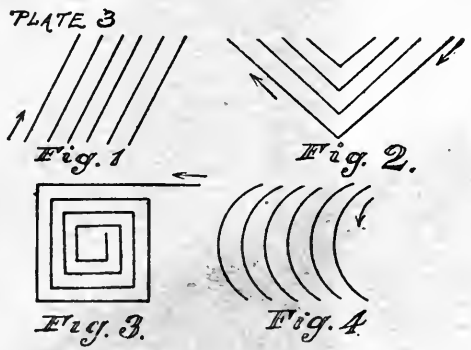
If your ambition does not dictate anything higher than that of a botch, do not spend any time trying to learn this beautiful art. The student who will succeed is one who will thoroughly master all the fundamental principles of each and every style of lettering and all the auxiliaries connected with their formation and execution. Do not think, dear reader, that all that is required is the necessary tools, a lesson or two, and you are finished. It takes but little more time, and the careful consideration of details to learn anything well, especially the art of engraving, and it is impossible to succeed, in even the plain work, if you do not first study with care the preliminaries.

The student may think that the exercises on Plate 3 are not necessary, or are only for children. Not so. The popular fallacy of first commencing to engrave script letters is a great mistake; while it is true that this style, or Roman, is the first that we learn to engrave, they are not the first lessons in engraving.

Script engraving is difficult if properly executed, therefore we must first practice some of the lines and strokes embodied in this style, and having mastered

them, which requires but little time, we can much more rapidly launch out into the mastery of script engraving Having endeavored to demonstrate the error of getting too ambitious to reach the top, and judging the reader's conception adequate to the obvious reasons mentioned, we will now commence the exercises referred to.

To design the exercises to be engraved on metal we must first paint the metal with some material on which we can design with a pencil, except polished articles, which we will consider as we progress. To design on



articles not polished, like those that have a satin or dead finish, about the best thing to use is Chinese White, a snow white paint that will dry instantaneously. The Chinese White you can buy at any art store and comes in bricks at 10 cents each or in bottles at 25 cents each; the latter is the best way to buy it, as by keeping it in the bottle it is free from dust. With a point of a knife take a small quantity of the paint and place on the article to be engraved. Now wet your finger and rub the paint over the article; a very thin coating is all that is required. As above stated, the paint will dry instantly,

and will not in any way injure the point of your graver. Now carefully design the exercises to be engraved, as shown on Plate 3.

Having first practiced the designing on paper until you are proficient in that regard, you will find it just as easy to design on the metal, when painted as described.

Holding the graver in your hand, as previously mentioned, commence cutting the lines as shown at Fig. 1, Plate 3, holding the graver so the flat part of the handle is flat with the plate, and the point of the graver will then be parallel with plate; the graver held in this position will cut a very fine line, known in the trade as a hair line. Place the point of the graver at the end of the first line, commencing at the lower end, pushing the graver forward, holding the tool firmly in your hand so the line will be cut the same depth from point of commencement to the end. The plate is held on a pad with the left hand, and is cemented on a small thin piece of wood; a cover to a cigar box will answer very well. If the plate we are to engrave is more than two inches square it can be tacked to the wood with very small tacks or pins, instead of cementing. In cutting the hair lines just mentioned, beginners usually start with a fine line and wind up with a line three times as wide and as deep; this is the point we wish to overcome. As formerly stated, the lines must be the same from beginning to end, and cut clean, pushing the graver forward in the direction of the arrows. Now cut the next line, and be very sure it is cut in every respect the same as the first.

Be extremely cautious that you are cutting it on the same angle, and when the point of the graver has arrived at the end of the line raise the hand a very little, at the same time lifting up on the graver and pushing

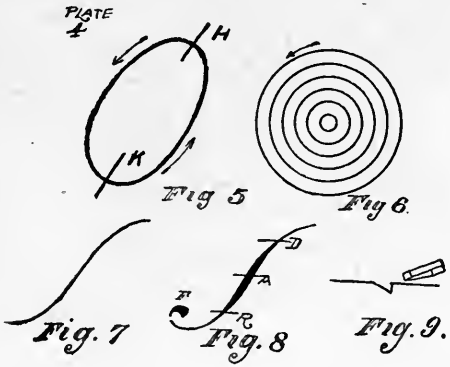
the same forward, which will break off the chip in front of the tool, and throw out the graver. A little practice will enable the student to throw the graver out in this way very easily and not leave any burr at the end of the line, a thing prevalent with the beginner, but quickly obviated with practice. Beginning the second line at the bottom and cutting from the right to the left, the operator will have the first line between himself and the graver point, thus enabling him to use it as a guide; using the first line for this purpose, and assuming the same to have been cut accurately, keeping the same distance from the preceding line from end to end, you are now in position to cut the balance in like manner. Practice these lines until you can cut them nicely, avoiding all errors outlined above, after which design and engrave the lines, at Fig. 2, avoiding as far as possible the errors as mentioned in connection with cutting the lines at Fig. 1. The point to gain in cutting the lines at Fig. 2 is to so cut them as to meet perfectly in the center, where the two lines come together; this accomplishment will be of much value to the student, as will be noticed as we proceed. By meeting perfectly in the center I do not mean coming nearly together, nor one line just a little longer than the other, but that the lines should so perfectly meet that one could not tell which was cut first. Exactness is requisite in these, our first steps, as well as those we hope to take later on. There is not one thing in the rudiments of this beautiful art that we can afford to treat as a trifle.

Next engrave the lines at Fig. 3, avoiding all the points of error as in Figs. 1 and 2, being extremely cautious when cutting the lines up to the corners. Having practiced cutting these lines until we are able to

cut them straight and otherwise as instructed, the student is prepared to take a step higher, and commence cutting the curved lines, as shown at Fig. 4. When cutting these curves we begin with the line at the right, as in engraving, all such lines are cut on a curve; by cutting to the right, I mean, in order to make the curve the graver is turned to the right. The reasons for engraving the line or curve at the right first is therefore obvious. It is to be understood, of course, that the plate is turned just opposite from its position when the lines at Fig. 1 were cut, and should be to engrave the curves now under consideration, so the curve at the right as shown at Fig 4 would be directly in front of the operator. In engraving these curves, as well as the lines at Fig. 1, the curve first cut will answer as a guide. All engraving of lines and curves, in fact all other work when possible, is so cut, and the work so placed in front of the engraver, that the cut just finished will not be obstructed from view by the operator's hand, or the graver. In some cases it is impossible to do this, but it is imperative where practicable.

CHAPTER IV.

Assuming that the student has mastered the cutting of the curves at Fig. 4 we will now endeavor to design and engrave a loop or letter O as shown at Plate 4, Fig. 5, with no shading at first. Begin at H, the top center of the loop, and cut down to the lower center at K, where the graver is thrown out as formerly described, picking the line up again at this point it is continued up to the top



center at H where the graver is thrown out as at K lower center. Great care should be exercised to cut the curve upon the same curve as the down stroke. Please note what is meant by center of loops, as it is here exemplified; I trust the reader will remember when latter referred to. Practice cutting this loop until you are able to manipulate the graver in its execution dexterously. Our next exercise at Fig. 6 you will find quite difficult to cut perfectly smooth and round, keeping the same distance from the line last cut after we have made the first round, thus cutting the lines the same distance

apart from the beginning to the inner or center coil. The lines should be cut the same width and depth and perfectly round. Having accomplished the desired result in the execution of this, our last of preliminary exercises, we are now, I sincerely hope, in the proper condition to enter upon the consideration and execution of the beginning, and all important line in the script alphabet, "the line of beauty" shown at Fig. 7. Begin by placing the graver point at the top end of the line and, holding the graver parallel with the plate, push the tool forward with great care, cutting only a hair line. We will consider the shading after we have mastered the cutting of the hair line. The line should be so cut as to appear the same either side up. When your graver point reaches the lower end of the line throw the graver out as formerly described and continue designing and engraving this line until you have thoroughly mastered its correct formation and execution, the sequel of which will place the student in position to feel gratified with this accomplishment, as he will note as he proceeds that the cardinal foundation stone to the art of script lettering has been placed firmly in position, which will answer as a stepping stone to his future success. The line under consideration is a much neglected part of the script alphabet and its mastery is, as above mentioned, while its neglect will obstruct the student's success. I therefore trust that my readers will follow the advice here given and above all things master the "line of beauty." The "line of beauty or capital stem" is used in the formation of 20 of the 26 capital script letters.

To shade with a square graver we merely turn the tool over to the right and by so doing the graver will cut a groove as shown at Fig. 9. Before we consider the

shading of the line we now have in hand, we should first learn just where the line should be shaded, the beginning, the center and the end of such shading. The line referred to should be shaded as shown at Fig. 8 where the cross line D shows the point of the beginning, A the center and R the end, when viewed from a cutting down stand point, and vice versa when cutting up. In shading the "line of beauty" or capital stem, we begin at the top as previously described and so continued until the graver point arrives at the cross line D at which point the graver is gradually turned from the operator as it is pushed forward and is so continued until the graver point is pushed down as far as the cross line A, at which point the line reaches its maximum width and gradually decreases from this point down to the cross line R, which decrease is made by gradually turning the graver back toward the operator until it is parallel with the plate we are cutting when the graver point arrives at the cross line R, and so continue to the end of the line where the graver is thrown out as described in a preceding chapter. Now while the tool is in the position as you lift it from the incision the finish at the end is made by placing the graver point just above the end of the line and making a cut as there shown, which is not here connected, as it should be but left separate to exemplify it correct formation. When properly executed and connected it will appear to be a continuation of the "line of beauty," thus making a very neat finish. It is made by turning the graver to the right quickly as the tool is pushed forward, turning the hand around to the right so as to make the necessary curve. Immediately after the graver is inserted, the hand is turned gradually back to the left and so con-

tinued until the point of the graver reaches the end of the "line of beauty" at which point it should be parallel with the plate and cutting a line the same width and depth as the line it meets.

That the line may be in the center of the shade we find it necessary to shade both down and up. It will be plainly seen that if we cut the line under consideration up only and shade to the right, the shade thus cut would all be to the right of the "line of beauty," unless cut as will be described later, which manner of execution is more difficult, and as the writer believes in first considering the mode of procedure most easy of conception as well as execution, we will continue our thought of shading both up and down. By both cutting down and up when shading the "line of beauty" the shade expands out both to the right and left of the center of the line, and in consequence does not deform the line. This manner of engraving this line does not apply to that style of cutting that we would use when engraving script monograms and large bright cut letters, but is by far the most satisfactory way to engrave the line in most script lettering. After the cut at the end of the line is made, as above described, we turn the plate around and place the graver point in the incision at R, Fig. 8, and cut up to A and D, as described for cutting down, except when the graver point is pushed up to D, by gradually turning the graver back to the left from A. It is plainly understood that the graver when arriving at D will be parallel with the plate, and as same is in the same incision cut by the graver on its downward journey it would not have any metal in front of it when D is reached and thus would not need to be thrown out, turned out, or broken out, but it is only necessary to very carefully lift

the graver up. If this operation is carried on as above described the result will be that the line will be so carefully engraved that the most critical eye would find it difficult to discern any radical imperfection.

One point favorable to this manner of cutting this important line is that the line should begin at the top very fine. In fact, the commencement of the line should be finer than the hair line which constitutes the balance of the letter, as it gives it additional beauty and grace. And if the line was cut up, the graver cannot as easily be made to run out to as fine a line as it can be made to make in the beginning. Therefore to the student I recommend this manner of execution.

To one dexterous in the use of the graver the line can be cut up very effectually by running the point of the graver gradually to the left, on arriving at R, as the graver is turned to the right, and continuing in like manner to A, from which point to D it is run back again to the line as the turn of the graver to the right, to effect the shade, is decreased. In order to have the shade equal on both sides of the center of the "line of beauty" it is necessary to cut the line when cutting up as above described. This manner of execution will give nearly the same effect as the one mentioned above, provided the hair line is continued to the end or top and thrown out to a fine line.

The points I have referred to are not noticeable in fine script work, but are thoroughly exemplified in heavy or large script lettering, such as is cut on coffin plates and large pieces of silver and plated hollow ware.

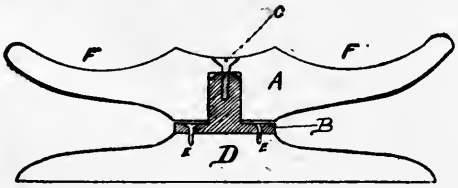
The sin (I think I am justified in giving the appellation of sin, as it is a sin against good taste) prevalent in cutting the capital stem as above mentioned is, instead

of turning the graver up to a fine hair line, it is thrown in deeper at the top, thus leaving the end heavy and blunt.

CHAPTER V.

Early in the beginning of these chapters the writer mentioned a sand bag pad on which articles are held while being engraved. Years of experience and careful consideration of all possible improvements to be applied to the art of engraving, and noting in such experience the necessity of a pad on which could be held articles rounding, such as pieces of a tea set, prize cups, etc., highly polished, and not mar them, holding them more firmly than would be possible with the ord-

PLATE 5



inary sand bag pad, the writer has experimented to some extent to devise such a tool as would answer the purpose, and the result of such experiment is a turn table, a sectional view of which is shown on Plate 5, which will revolve perfectly easy.

In the top A of the turn table, which is made of oak wood, a circle pad, such as is used with the Lancaster Engraving block, will just fit in the grooves F F. With the pad laid in the grooves mentioned, the reader will conceive that by placing a soft chamois skin over the pad he can put any rounding and highly polished article in this section, by so covering, and hold the same very firmly. When he desires to turn the same with his left

hand to make a curve in the letter, instead of turning the article on the pad, the entire top of the turn table will revolve on the pivot B, which pivot is made of brass. All other parts, except the three screws, are made of wood, at a very moderate cost.

Should the engraver desire to engrave such a plate as that which we are now, at this stage of our course, engraving upon, or a coffin plate, the same is nailed to a thin piece of wood, similar to a cigar box cover, and laid flat onto the round part of pad, and turn the same as though we were engraving it on an ordinary pad, except that the top of the turn table turns on a pivot instead of the article we are engraving turning on pad, and turns more freely.

If we have in hand to engrave a small article, such as a match box, that may be highly polished, the same is placed on a four inch pad, which pad is placed in the center of the circular pad, and in order to hold the former pad in position, we nail or cement a leather washer, such as are used on carriages, of a size that will fit the hole in the circular pad. Now the reader will note that with a pad so arranged on our turn table it is an easy matter to hold with our thumb and index finger of the left hand such articles as highly polished silver match boxes, hat markers, coat markers, and hundreds of other little articles of similar description. In turning the same to make the curves in the lines the top of the turn table would revolve, thus holding the article firmly on the pad, not moving the same on the pad at all. Therefore the object of this device is obvious, and will demonstrate to the reader the fact that he may take from any silversmith's stock any article and engrave same without marring or scratching the underside of the

article to be engraved. While with the plain sand bag pad in order to make the curves on the article which we are engraving, it is very necessary to turn the same, thus marring and scratching the side opposite the one being engraved, and after same is engraved it is necessary to do much polishing to put the article in its original condition, making unnecessary work, and in many cases it is impossible to put the article in its original state. Of course, a soft Chamois skin can be laid over the ordinary pad, and which would, of course, extenuate the tendency to mar the article, but even with this operation there will be more or less scratches on the article when finished.

Perhaps some of my readers would say that a good engraver would not turn the article on the pad at all if it was highly polished; to such I wish to state that it is possible to do so, but is far from being practical. It is much easier to turn the article with the left hand, as we turn the graver with the right, thus expediting the curves.

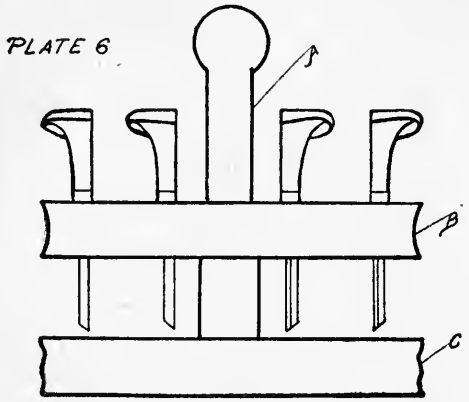
In engraving, many strokes, which are directly opposite, it is necessary to reverse the article, either by turning it around or picking it up and turning it around and laying it down again, which, of course, is very unreasonable.

The turn table above described, is, in the writer's estimation, a very valuable article, and can be made by any good wood turner for about two dollars; the circular pad can be had for one dollar, and the four inch pad for fifty cents.

It may be made in some parts of metal, while the one described, to be made in a cheaper way, is made of wood, and may have a ball bearing.

A graver stand would, perhaps, be of little use to the student at this stage, but as the one shown at plate 6 is a very good companion piece to the turn table just described, and the same being a very convenient and useful article for the engraver, I will at this time describe it.

The center piece A can be made any length desired; about ten inches is a good length. The piece B, through which the gravers are placed, is about one inch thick,



and eight inches in diameter; base C is same size. In all there will be three pieces. There can be two rows, holding fifteen to twenty gravers. This stand, placed on a table, the engraver can turn it around and readily select the graver wanted, and by keeping them in this stand they are free from any danger of point being damaged. The piece B turns on shoulder of center piece A.

The writer has had a great many of these made, and when ordering only one at a time they cost but $1.50, and I am sure the reader would find it a good invest-

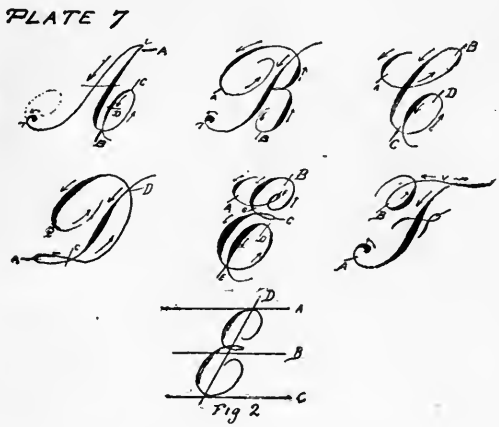
ment. They can be made by any good wood turner, and if made of oak wood it makes a very handsome ornament for the work bench. The one shown at plate 6 is designed very plain, but can be made as ornamental as desired, using the same idea.

Every man has, or should have, some paramount object in business life which will employ his mind and fill his heart. If engraving is the reader's object of accomplishment, I trust he will cultivate taste and seek perfection, and remember that perfection, (as near as we are able to reach it), is accomplished by continual practice and study of the art.

It being the object of these chapters to so instruct that there can be no impediment to discourage the student in his cupidity for the art, and having experienced, in personally instructing students, the expediency of not only the correct formation of each and every letter in the script alphabet, but the correct manner of engraving same. I shall go through the alphabet with the reader, and carefully consider cutting every line in each letter, that we may thoroughly understand which line to cut first and last, the beginning and end of same, and such study cannot do otherwise than elucidate to the student's entire satisfaction.

CHAPTER VI.

Owing to the fact that there is embodied in this style of lettering nearly all the curvatures and cuts necessary to formulate any other style of letters, it will not be necessary to spend as much time on those that will follow; consequently we will begin with the letter A. The student, of course, must now remember that we have explained the line of beauty, and, in consequence thereof, will not consider that part of each letter to its fullest



extent, but refer to same, and expect the student to depend upon the contents of his cranium to reveal to him that which he has been instructed in.

Referring to plate 7, the letter A is engraved by cutting the line of beauty in direction of arrow, and the first stroke in the letter is to cut this line as formerly described; after which, the graver point is placed at the top of the letter, at the point of line A, and cut down,

beginning with a hair line and shade as the graver is pushed forward by gradually turning same from you to the right, and so continue until the maximum width of shade is reached, from which point the graver is gradually turned back to the left, or toward the operator, as it is pushed forward and so continued until the line reaches the minimum width, at which point it is thrown out by raising the graver and giving same a short quick turn to the right, thus bringing the incision up to a fine point and even with the surface of the plate at the center of the loop B.

After turning the plate or article you are engraving half around on pad, the line is picked up again at the fine point where it was thrown out and continued up to center of loop at C, holding the graver parallel with plate and cutting a fine hair line. Here it is thrown out as before, plate turned half around, and the line again picked up, which is commenced by a hair line, but as the graver is pushed forward it is gradually turned to the right to effect the shade desired until graver point arrives at the cross line D, at which point the shade reaches the maximum width, and from this point the graver is gradually turned up to the left, thus decreasing the shade as the graver is pushed forward until just before crossing the loop at B, from which point it is continued a hair line.

In designing script letters the beginner should draw three guide lines; one for the top of letters, one for the bottom, and one between the two for a center guide. I do not show the lines referred to here, as there being other more important drawings necessary to make plain the manner of execution, which, with the guide lines,

would be apt to confuse the eye as to the formation of the letters.

To engrave the letter B, the capital stem is cut first; next, the graver point is placed at the center of the loop at the center of the right of the capital stem, which loop is just above the center guide line, with the lower line of the same resting on the center guide line.

The student will note, therefore, that this loop is a very little above the center. Pushing the graver forward, cutting a hair line until the turn is made, then the tool is gradually turned to the right to effect shade, and up again to a hair line, as previously mentioned, for such shading, and thrown out just as the capital stem is reached, where it is picked up again and continued around to A, shading as shown, which shade is executed same as for shading the letter A.

Now, turn the plate half around and pick the line up again and continue a hair line to the end. By picking up the line, I do not mean to place the graver in the incision just cut, but to begin closely to the same as possible. Next, begin at the center of loop, at B, and cut up to the line previously cut up; throw the graver out and pick up again on other side of the line and continue to the center of the loop, resting against the capital stem. Now, as the plate is in this position, the hair line at the left of the center of loop, at B, is cut, beginning at end and cut down to B.

C is engraved by beginning at the end of the left stroke and cutting down to A, where the graver is thrown out; next cut down from the center of loop at B to center of loop C, holding plate in same position as graver is thrown out at A. Pick the line up at cross line A, and cut up to center of loop B; turning plate

back to the left, beginning at cross line C, cut up to center of loop D, where graver is thrown out; turning to the right a very little, the line is picked up and continued around to the end.

When the graver is thrown out from a shade the reader will remember he must gradually raise the graver, turning it up from the right to the left, at same time gently lifting up on graver, by which operation, with a short quick turn to the right, the graver point will leave the incision coming out to a fine point. The style of script here shown is very plain, and can be modified from this general form to any desired style, after the student has passed through the first ordeals of lettering, and embelished to suit his artistic eye.

I wish to explain to the reader that the illustrations here shown cannot be as perfect as they should be engraved, as the cuts are etchings, and must not be looked upon as samples of engraving. The work will, however, be as perfect as is required to exemplify the formation of the letters and the manner of engraving the same.

The letter D is engraved by cutting the line of beauty or capital stem first, the lower end of which is at the cross line A. Next beginning at the cross line C, cut over to center of loop A; reverse plate on pad, and beginning at cross line C cut a hair line up to D; now turn plate a very little to the right and pick the line up on the opposite side of capital stem and continue around to B, where graver is thrown out, plate turned to the right, line picked up again and continued to end.

The letter E is considered by most students a difficult letter to engrave. Appreciating this fact I have endeavored to arrange a little frame in and around which this

letter can be easily designed and engraved. Such a frame is shown at Fig. 2, plate 7, where A represents top guide line, B the center guide line, and C the lower guide line. The line D, which is supposed to be on an angle of 45 degrees, is the angle guide line. Sketching the letter around this angle line, allowing the center loop of the letter to be made just above the center guide line, I fail to understand how any apprentice would find it difficult to execute; at any rate I feel sanguine that its use would be conducive to symmetrical formation.

To engrave the letter E, first begin at the center of loop C and cut down to E. The reason for engraving this lower portion first is that by so doing we have the aid of same for guide when cutting the shade stroke above. Next, begin at center of loop B and cut down to G, where the graver is thrown out, plate turned a little to the right, the hair line picked up and continued to center of loop C, turning the plate around to the left to gain the proper position to begin the upper left hand stroke, which is cut down to A and graver thrown out; after turning the graver to the right sufficiently to place the line in proper position in front of graver, the line is continued up to center of loop F, where the graver is thrown out, plate reversed, and hair line picked up at same center and continued around to B; now, turn plate back to the left, and placing the graver point at cross line E, the hair line is continued up to center of loop D, graver thrown out, plate turned, and line continued to end; and thus endeth the laborious task of engraving the letter E.

To engrave the letter F, as with all letters, the main body stroke, or capital stem, is cut first. The lower end

of this line of this letter is at cross line A, the finishing cut being made in the direction of arrow around to meet the line of beauty, after which begin at the point of V, at the top of the letter, and cut around to B, where the graver is thrown out, picked up again after turning the plate a little, and continued around to the end; residue of top stroke is cut in the direction of the arrow, beginning at the point at V.

The line crossing the line of beauty can be made as shown, or a straight line across the center gives a very neat appearance.

CHAPTER VII.

The word alphabet is derived from two Greek characters, and signifies the letters of a written language disposed in their regular order.

Among the Greeks and Romans the invention of letters was generally attributed to the Phœnicians; but the Egyptians took the initiatory step toward the perfection of a phonetic system of writing when they made their hieroglyphics the signs of articulate sounds. In Egypt, however, the phonetic system was ever imperfect, in consequence of the expression of the same sounds by many symbols, and the use of the same symbols to denote many different sounds, it remained for the Phœnicians to bring order out of this chaos.

Their newly invented alphabet the Phœnicians made known throughout the ancient world, and from it every other alphabet is directly or indirectly derived. The resemblance between some of its characters and their hieroglyphic originals is very decided, and may still be traced, even in a number of our English capitals, essentially the same as the symbols of the Latin alphabet, which were borrowed in turn from a Greek source.

Tradition variously ascribes the origin of letters to Thoth, an Egyptian; to Odin, a Scandinavian God, and to Cadmus, the Phœnician.

Tacquet, in his "Arithmetical Theory," informs us that the various combinations of the alphabet, without any repetition, will amount to 620 sextillions, which is equivalent to infinity.

While the beginner in the art of engraving may think before he has finished engraving the twenty-six letters

in the alphabet that it is worthy of traditional mention, for the benefit of the student I wish to quote the number of letters in the different languages derived from the source above mentioned.

The English alphabet contains 26 letters; the French, 25; the Italian, 22; the Spanish, 27; the Russian, 41; the Hebrew, Samaritan, Syrian, and Chaldean, each 22; the Arabic, 28; the Persian and Egyptian, each 32; the Turkish, 33; the Georgian, 36; the Armenian, 38; the Sanscrit, 50; the Abyssinian, 202; and the Indian or Brahmanic, 240.

Thus noting the many vicissitudes which the origin of the English alphabet has passed through to reach that point of perfection that it has in the nineteenth century, the student should feel grateful that there are only twenty-six letters in the alphabet to thoroughly master.

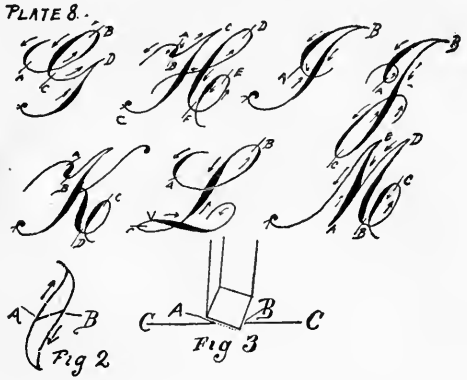
The letter G, Plate 8, is engraved by first cutting the left hand shade down to A; next begin at center of loop B, cut down to C; next place the point of the graver at the top of the capital stem D, and cut down to V, which place denotes the point where the finishing cut and end of the capital stem meet. Now reverse the plate and cut the hair lines in direction of the arrows. Of course, the finishing cut at the end of the line of beauty is made previous to cutting these lines.

To engrave the letter H the short left hand shade is cut first, which shade is cut both up and down, but not in same manner as the double cut in line of beauty.

A magnified view of this cut is delineated at Fig. 2.

The reader will see that the shade is made by placing the point of the graver at line B and as graver is pushed forward it is immediately turned over to the right to make a cut the maximum width of the shade, and as the

graver is turned over as it is pushed forward the cutting edge of the graver will extend over to line A, while the point of the graver will traverse the right hand line of the shade from point of the line B. An end view of the graver in position to make this cut is shown at Fig. 3, where A and B are supposed to be the same as in Fig. 2, C C line represents surface of the plate. The graver



is thrown out at end of the shade as formerly described for completing such shades. The plate is now reversed, point of graver placed at A and the upper part of the stroke manipulated in same manner as described for cutting the down stroke, this double cut is of vital importance, and if the student cannot execute it accurately, I would advise a short stop at this point and continual practice, cutting this double cut until efficiency has crowned his efforts. The necessity of this manner of executing this stroke is that it should come up to a fine point exactly the same at the top as

at the bottom, a graceful turn to such point, and it is utterly impossible to make it in any other manner and obtain the same result.

Now while the graver is in position as it leaves the shade at the top A, it is again inserted and the line A continuing to the end in direction of the arrow; while the plate is in same position the line of beauty or capital stem is cut down beginning at point C, while the plate is in position as the end of the capital stem is finished, the finishing cut at the end is made. Now place the point of the graver at D, center of loop, and cut down to F; reverse plate, and make the upper shade of the line of beauty. Cut hair line from B up to C, next place the graver point at the right of the shade stroke from D to F and cut the hair line up to D. With plate in same position cut hair line from F up to E where the graver is thrown out.

The graver is thrown out at center of all loops. The graver is again inserted at center of loop E and continued to end of line. While the plate is in this position the hair line crossing the two main strokes is continued to end, in direction of arrow.

After the capital stem of the letter I is completed the graver is placed at the top of said line and continued to A, thence the hair line to the end.

Letter J is cut by first cutting the main body stroke: next the graver is placed at the top of said line B and continued to A; while plate is in same position the lower loop is cut by beginning at the left of capital stem and cutting in direction of arrow to C; the plate is now reversed and the residue of the hair line mentioned is made. While the plate is in this position the hair line from A is cut to the end.

The letter K is engraved the same as the letter H for that part which is the same as the letter H, for which the shade from the center of the capital stem is cut in the same manner as the double cut above described, except that the said cut should be a very little heavier as it nears the bottom at D. The hair line at the right and top is cut from the center loop up and the cut at the end executed in same manner as described for making similar cut at end of the line of beauty. Now place the point of graver at D holding same up straight or parallel with plate, which position is necessary for cutting hair line and cut from D up to C, thence to the end of the line.

The letter L is engraved by first cutting the upper left hand stroke down to A, then the line of beauty is cut down, plate reversed, line of beauty shade completed, hair line cut from A up to B, graver placed a little to the right of the loop C, the shade across the line of beauty at the bottom is made by beginning at the point V and cutting in direction of arrow to the end of the line, bringing the shade up to a hair line as delineated, without throwing it out. Reverse the plate, place the point of the graver at V and continuing the line to the center of the loop C; this cut is made by some engravers by beginning at the center of the loop C and continuing the line to the end. My object in starting the line from the point V is that we can make a better loop by cutting it around to the right, than we could by cutting it around from the left. The expediency of this mode of procedure will manifest itself to the practioner by practicing to execute the cut in both ways.

In engraving the letter M we begin at the top and cut four lines down as follows: first the line of beauty, next shade from E to A, this shade stroke is either cut up or

down only, or both, cut one way in cheap work, next hair line from D nearly down to A as delineated, next shade from D to B, reverse plate, cut up stroke of shade from A to E, hair line from B to C, thence to end.

CHAPTER VIII.

The letter N, Plate 9, is engraved by cutting the line of beauty first, after which place the graver point at top of said line A and cut down to B, which shade is shaded both up and down as described for shading line of beauty. In cheap work either cutting up or down only is sufficient; the reason for cutting both ways in fine work is that by so doing we get more beautiful effects.

The hair line from B up to V is engraved in the same manner as hair line of beauty.

Letter O is engraved by first cutting from A to B and next from C to end of line. Reverse plate, beginning at the end of line cut up to A, next place the graver point at cross line B and cut up to C.

Letter P is engraved in direction of arrows and as described for engraving the letter B as much of said letter as is the same as letter P.

The letter Q is engraved the same as the letter O where those parts are the same style as said letter. The line from center of loop D is cut when the letter is made on a large scale, both ways, half shade being cut in one

direction the other half the other, but for small capitals a cut can be well executed by making it one continual stroke from cross line D to the end.

The letter R is engraved the same as the letter B, except the lower right hand stroke which stroke is engraved from the center of center loop down to D, the same as described for engraving the same stroke in the letter K, continuation of said stroke being engraved the same as described for engraving that letter

The letter S is engraved by first cutting the upper left hand stroke down to B, next the capital stem from center of loop A down to point V; now reverse the plate, cut shade of line of beauty up as formerly described for making such shades; then place the graver point at cross line B, cut up to the center of loop A.

The letter T is engraved according to the arrows and as mentioned for engraving the letter F, which two letters are the same except that in the T the cross line in the center of line of beauty is absent.

The letter U is engraved by first placing the graver point at cross line H and cutting down to center of loop C; next place the graver at the top of stroke K: it is laid over so as to cut the line the width of shade desired, and pushed forward, holding the graver on same angle until nearly to the cross line E, where it is gradually turned up to the left, and thrown out at cross line E. The top of this stroke should be perfectly square, and on a line with the guide line. It is quite impossible to insert a square graver in cutting such a stroke, so as to make it as desired; the appearance of the stroke made in the manner described would be as at Fig. 2, the point A being where graver is pushed in, but before the graver reaches its maximum depth in the incision, the cutting

edge of the graver would be nearly as far down if not entirely so, as shown at line B. This diagram may be an exaggeration of the manipulation of this important point in cutting this line, it of course depending upon the angle to which the graver is sharpened in front, but in most cases the stroke would be in appearance about as shown at Fig. 2: if not as much as there delineated it would be on angle instead of being square or flat with the guide line. Now in order to square this line up the graver point is again placed at point A and the stroke C is cut. The cut as shown at C is made by pushing graver in direction of arrow C, which cut will square the shade perfectly, and if made as it should be, it will be almost impossible to detect that the second cut has been made. The student will, of course, understand that the cut C will be placed down on the angle from B to A Fig. 2; a very little practice will enable the student to execute this line dexterously.

In cutting the letter U, after this portion has been engraved, the plate is reversed and the graver point is placed at cross line R and cut up to A. The student will note therefore that this line is a double cut, placing the graver at cross line A cut down to B center of loop, turning the plate the graver is again inserted and the hair line from B finished; next the hair line from C up to that point of the shade as marked by line F. Now place the graver point at cross line E and cut up to D, turn the plate around to the right and cut from D to the end of line.

To engrave the letter V, plate 10, first cut the double cut from B to C; next cut the main body stroke, after which cut the hair line from B over to the end, next hair-line from C up to A, next the hair line from the bottom

of the letter up to V, after which make the little cut at the end which meets the hair line at the point of the letter V.

The letter W is cut the same as the letter V; it embodying the same strokes, it is not necessary to direct the student's method of procedure.

The letter X, which is seldom used, is engraved by first cutting from C up to A, reverse the plate and cut from G to E. These being the main body strokes, the residue of the letter is cut in direction of arrows, and

the manner of procedure according to directions heretofore mentioned for cutting such loops.

The letter Y is engraved by first cutting the down stroke of the line of beauty, at which time the finishing cut is made at the end: next cut half of the double cut from B to D; reverse the plate, shade the beauty stroke up and the upper half of the shade stroke from D to B, throwing the graver out at the center of the loop B, turning the plate sufficiently to gain the proper position; place the graver point at cross line B, continue to C, where the graver is thrown out, the line picked up again and continued to the end. The hair line from D to A is now cut, which finishes the letter.

The last letter of the alphabet, Z, is cut first by beginning at the center of the loop A, and cutting down to C. This line is not shaded. Next, placing the graver at the point of the reversed V, cut in direction of the arrow over to B where graver is thrown out and hair line continued to the end. Reverse plate, beginning at point of V just mentioned, cut around in direction of arrow to center of loop A. While plate is in position as this stroke is cut, place the graver point at the point of V and cut in direction of arrow to end of hair line, the graver is gradually turned up to left after shade is made, and continued a hair line, not throwing the graver out until the end of the hair line is reached. Now reverse the plate, and placing the point of the graver at the point of V last mentioned, cut in direction of arrow over to C

Thus ending the instructions for cutting the capitals of the script alphabet, I wish to impress upon the student's mind a few points of vital importance to his success which I have in going through the course of instructions thus far, endeavored to so instruct that he might accomplish his work in the most beautiful and at the same time easy manner. Do not forget that in cutting a loop that the graver should begin and end in the center of same when cut in opposite directions. By so doing you will be able to execute a loop in its proper formation, where, if otherwise executed, it would be impossible to make a graceful curvature.

In going through the alphabet I have mentioned many times the line of beauty, capital stem and body stroke; this I have done for the reason that the line referred to is known by the three names mentioned, and as one of the three is known if not the entire number, to all engravers, I have mentioned all three for the benefit of those who

are not familiar with them, thereby being able to speak intelligently to all in reference to this important line, and where I have mentioned either of the three I have referred to the main body stroke of the capital letter. In reference to the cutting of this line when shaded both ways, I wish to repeat the fact that some of our best engravers cut only one way, shading up stroke, but for reasons that I have previously mentioned I deem it expedient for the operator to cut the line both ways, and after he has enabled himself to dexterously execute this line he is at liberty to use either one of the ways for cutting it. I should, however, recommend the cutting of the line in both ways; but in cheap engraving, of course, we are not supposed to enter into all of these points of accurate execution, and therefore the student could shade this stroke in one cut by following the directions mentioned for cutting the line of beauty in the beginning of instructions for cutting said line, the double stroke such as at cut B to C in the letters V and W, would state that it is best that this cut be made by cutting both up and down, for reasons I have delineated for such cuts. However, many expert engravers only cut one way, either up or down, in bright cut work on silver or plated ware. I often cut only one stroke to make this shade, and that either up or down as is most convenient, but usually cut up. But for fine work on polished material, such as gold watch caps, where a deep and most perfect cut is requisite, I cut first down, then up. If the reader will notice a fine piece of engraving on a Swiss watch cap he will there see that the cuts mentioned are cut both up and down, and the effect is most beautiful.

CHAPTER IX.

Now that I have by the aid of the arrows, guide lines, cross line marks, etc., guided the student into the best manner of engraving the capitals of the script alphabet in referring to such strokes in future instructions I will of course take it for granted that he understands the correct manipulation of all strokes and cuts that we have gone through in engraving the alphabet.

To the student who is extremely anxious to advance with the 19th century rapidity, I would most earnestly advise not to endeavor to cut either the figure or the lower text letters until he can with some degree of exactness execute the letters we have gone over. By this method you will be more sure of rapid success in completing your studies of engraving.

We will now consider cutting the figures, in the style appropriate for combining with the capitals we have been instructed in.

The figure 1, Plate 10, is engraved by cutting the body stroke down first, which is squared up at the bottom as mentioned for squaring up the top of the main stroke in the letter U of the capitals previously mentioned; as the graver is thrown out at the bottom it will appear as shown at A of the diagram in the figure 1, and the student will therefore note that it is not flat with the lower guide line. In order to make it so, cut B is made by pushing the graver forward in direction of arrow by placing the point of the graver at the point where the lines C and H meet and cutting on an angle in direction of the arrow, which will perfectly square the bottom of the figure with the guide line.

In designing figures it is necessary only to draw the top and bottom guide lines.

The figure 2 is engraved first by placing the graver point at V and cutting up to A, where the graver is thrown out, line picked up again and continued to B. As the graver is thrown out at B it is placed again at the point of V and the main stroke is continued to the end; now reverse plate and placing the graver point just above the lower end of main body line, cut the stroke C to the end in direction of arrow. This can be made one continuous cut if the tool is handled skillfully. It is sometimes made by cutting both ways, i. e., a double cut, such as has been explained. Next cut the hair line from cross line B to end.

In engraving the figure 3, we cut the first shade to the right by placing the graver point at cross line C, cutting up to D where the graver is thrown out and again placed at line E, and cut up to cross line A. Turning the plate, place the graver point at the cross line where it was thrown out and cut around to the end of the line, while the graver is in this position. Now place the graver point at D and cut over the end of the center loop. In small figures this loop is imitated by holding the graver parallel as in cutting the hair line it is thrown in deep, which cut gives an appearance of a loop. If the figure is large it is of course made a regular loop. Now place the graver point at end of line F and cut up to B, where the line is continued, and cut hair line around to C in direction of arrow.

In engraving the figure 4, place the graver at the top of line C and cut down, square the same by the aid of extra cut as described for squaring up the bottom of the figure 1. Next cut from the center of loop A up to

B, squaring the top as formerly described; now place the graver point at V and cut the cross line to the end; reverse plate, placing the graver point at beginning of last line, cut to point of V and cut over to center of loop A.

Figure 5 is engraved by beginning at cross line B, cutting up to A. Next the line connecting the top stroke with the bottom part of the figure: now place graver point at end of stroke C and cut in direction of arrow, and cut into line D; now place the graver point at cross line A and cut down to E; next place the graver point at V and cut around to cross line B, and thence make the cut X, as described for making cut at the end of the line of beauty, which cut should be the same as said cut.

The figure 6 is engraved by placing the graver point at cross line A and cutting down to C, thence up to B and continue hair line to the end. Next make the cut at the top and right, which is cut the same as the cut X for figure 5.

In engraving the figure 7, the main body stroke is cut the same as in the figure 1. Next the stroke trom B to A is executed by starting at a fine point and gradually turning the graver over, throwing the same in deeper as it is pushed forward so that it will be blunt on the end where the graver is thrown out; the little point at A will be higher than the residue of end of said cut, and when the cut at the top is made in the direction and formation as shown, will meet this cut so that the little point referred to will be visible, thus making the finishing to the figure. The figure 7 is a very beautiful figure when accurately made, and is indeed a very awkward and homely figure when otherwise executed.

The figure 8 is engraved in many different ways. The one used mostly for small figures, size that would be engraved inside of an ordinary wedding ring, is engraved by first cutting from cross line C to line B, where the graver is bluntly thrown out, or, in other words, the chip in front of the graver is broken off by lifting graver up. Now reverse plate, and the graver point placed at cross line A, cut down, gradually turning the graver to the right to execute the necessary shade which meets in the center of the figure, the line we have cut up to B. If this is done as it should be when the line crossing the shade stroke mentioned is made, it will entirely obliterate the visible meeting of the two lines. This cross line is cut by placing the graver at B and cutting up to A; next on opposite side of the shade from line B and cutting down to C in like manner. If we are engraving this figure on a large scale the line would be engraved by one continuous stroke, as described for engraving the line of beauty when it is engraved by making one stroke only. These methods of engraving this figure are the ones most prevalent.

In engraving the figure 9, cut from cross line B up to A, next from A to C, then the end cut of the figure at the bottom is made as described for making such cut in in figure 6; next hair line from C is cut.

Figure 0 is engraved by cutting from A to B, and from B to A. The graver should begin at center and end in the center of the loop. The stroke should curve equally on both sides to gain the correct formation of the figure.

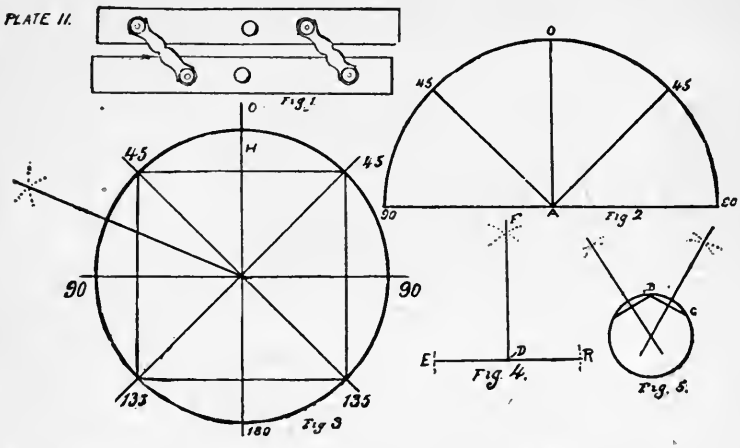
Figures 3 and 4 shown at the right of 0 are engraved in direction of arrows and according to cross lines there shown. It is not necessary for me to direct the student how to cut these two figures, as same cuts are embodied

in the figures we have just described. I show the 3 and 4 of a different style, as the style we have shown is used to some extent, and if the student prefers them to the ones formerly described, they will harmonize with the other figures in style shown.

CHAPTER X.

Before we consider engraving the lower letters of the script alphabet, a brief consideration of valuable accessories to the correct symmetrical formation of same would be expedient.

As has been formerly stated, the script letters should lay over to the right on an angle of about 45 degrees.



It has been my experience in instructing students that many fall short of the exact conception of an angle of 45 degrees, without the aid of an angular circle of a protractor. A protractor is a half circle and a complete circle consisting of 360 degrees, a protractor would therefore consist of 180 degrees.

A simple form of a protractor with only the 5 angles shown is delineated at Fig. 2, Plate 11, the half circle containing 180 degrees divided into four equal parts, each part would be from line to line 45 degrees apart;

the line o being perpendicular, and the line or bottom of the perpendicular 90 being horizontal; a line drawn from the apex on a line crossing the arc half way between o and 90 would therefore be on an angle of 45 degrees.

Such an instrument as above described can be easily made by the student or he can purchase them with all of the degree registers stamped thereon at the stationers. I should advise all beginners to purchase such an instrument, they being made of celluloid are very inexpensive and their use to the student is conducive to exactness in the formation of letters and grinding angle of gravers.

As geometrical drawing is required to make the protractor mentioned and to obtain the various angles that a student may need in getting any desired angle in sketching, copying or mounting up tools, we will briefly consider same as may be required for such work as the engraver will be called upon to execute. At Fig. 3, is shown a complete circle with the perpendicular H and 45 degrees angles drawn, also a square inside of the circle. This circle with these lines, except the 45 degree angles, are of radical importance to the engraver in formulating inscriptions or designing and engraving monograms of all styles. As we now consider it, we will expect the student to remember the details when we advance to that stage in the art of engraving monograms as we will there have occasion to refer to it.

If we take our compass and make a circle with it, we of course have our center, but there are many articles which come to the engraver which are perfectly round, and in designing on such articles any style of lettering, it is necessary that he know the center point of same; it is the rule of many engravers to draw the zero and 90 degree lines and guess at the center, this may do very

well for the well cultivated eye that can draw such lines and obtain the desired central point with some degree of exactness, but there are many cases that call for finer classes of work, where it is necessary that we know geometrically where such center is, and especially to to the student, therefore we will now consider how to find the center of the circle.

In order to find such center it is first necessary to learn how to erect a perpendicular on a straight line.

Referring to Fig. 4, assuming D to be the point on line E R, at which a perpendicular is to be drawn, on either side of D measure with your compass equal distance from D, D to R, D to E; from E and R with the radius about equal to the distance E R, draw two circular arcs cutting or crossing one another; if their point of intersection F be joined to D the line D F will be the required perpendicular.

To find the center A of the circle, mark on the circumference 3 points, A B and C, Fig. 5, join A to B, C to B, at the middle point of each of these lines erect a perpendicular as above described. After making such line the point of intersection of these perpendiculars will be the center of the circle.

Now that we know how to find the center of a circle, and that we know the manner of erecting a perpendicular line, the next thing necessary to make the various angles is to learn the best method of subdividing an angle into equal parts. In addition to the use of the protractor for such purposes, we may use the following graphic method, which is perhaps a more scientific mode of procedure.

Referring to Fig. 3, suppose we wish to draw a line half way between 45 and 90 angles, we open our com-

pass, now place one point of the compass at 45 degree line and draw an arc to the left, now place one point of the compass at 90 angle line, and draw another arc crossing the one previously drawn; now a line drawn from the point where these two lines meet to the center of our circle will be equal distance between 45 and 90 angle lines; our circle can thus be divided into as many degrees as desired.

After making the angles in our circle, the student can plainly see that in order to make the square inside our circle all that is necessary is to draw a line from 45 degree angle at the left to the same line at the right, thence to the 135 degree angle, thence to the left to the same angle, and from this angle to the 45 degree angle or place of beginning.

Now we are in full possession of the knowledge necessary for the work that we have in hand.

At Fig. 1, is shown a very useful article for the engraver, especially on very flat work; it is a parallel rule, with the aid of which a student can draw parallel lines with great accuracy. Such a parallel rule can be made by the student or can be purchased at the stationers, of ebony, for 35 cents, being made by Keuffel & Esser Co., of New York city.

The student may look upon these drawings as unnecessary to accomplish the art of engraving. To those of such an opinion I would state that he is in error; it is obviously plain to the student who is desirous of doing work accurately that by acquainting himself with the use of such implements, and a knowledge of such drawings cannot do otherwise than place him in a position to execute his work accurately and being able to prove such accuracy in a scientific manner. After the student

has become an expert engraver it may then not be necessary to use such tools as I have here described, only when doing work of a high class, but if the student becomes proficient in the use of such tools he is starting on the right road to success, and he will shortly know by comparison with the work of those who deem such accurate method of procedure inexpedient, that his work is far more symmetrical and the reasons for such accuracy is demonstrated.

I cannot too forcibly impress upon the mind of the student the necessity of using all methods of work that will accomplish the best results, and that I may at this time give the student the assurance of the advisability of following such lines, I wish to quote from that noble and honored personage, whom all Europe admires and loves, and whose advice cannot be otherwise than pre-eminent, I give the following from the pen of Mr. Gladstone in his advice to young men:

"Be sure that every one of you has his vocation on this earth and that it rests with himself to find it. Do not believe those who too lightly say, 'Nothing succeeds like success.' Effort, honest, manful, humble effort, succeeds by its reflected action, especially in youth, better than success, which indeed, too easily and too early gained, not seldom serves like winning the throw of dice, to blind and stupify. Get knowledge all you can. Be thorough in all you do, and remember that though ignorance often may be innocent, pretension is always despicable. But you, like men, be strong and exercise your strength. Work onward and upward, and may the blessing of the most high soothe your cares, clear your vision and crown your labors with reward."

CHAPTER XI.

Engraving the lower case letters of the script alphabet is not considered as difficult as the capitals; however their execution requires much care and a well trained eye, but, supposing the student to have thoroughly practiced and mastered the capitals he will not find this, his second journey through the alphabet as perplexing as the first. The student will note that if the angles of the lower case letters are not symmetrical that it will be even more noticeable than in the capitals, therefore the rules as cited for making sure their exactness must be strictly followed.

The proportional size of the letters as compared with the capitals depends entirely upon the article to be engraved; for illustration, when engraving inside a very small ring, the capitals would be much smaller in proportion than if we were engraving an article with ample scope for the initials or inscription. After some study and practice the student's judgment will dictate as to the size and proportions of letters to be engraved in a given space. No better method can be resorted to to form an idea of the correct proportions of letters than a careful observance of the work by a good engraver on and in difficult places. This observance will reveal to the scholar the fact of a broad variation from the set rules for proportions, and this deviation is demonstrative of ability, as these variations must be made in order that the work will look well and harmonize with the shape and space to be engraved.

When we have ample space the following proportions are used by most engravers and will be found the best

for the student to practice with. Capitals two and a quarter degrees, lower case *b*, *h*, *k*, and *l* two degrees, *f*, one and two-thirds degrees, *d* and *t*, one and a half degrees, main body stroke of *p*, one and a quarter degrees above the lower guide line. The *f*, *g*, *j*, *q*, *y* and *z*, one and a quarter below and one above, main stroke of *p*, one degree below; all other lower case letters one degree above the lower guide line. The lower guide line referred to is not the one at the end of the letter, but the one under lower case *a*, and letters of the same height.

Referring to plate 12, the letter *a* is engraved, as in

all other letters, by cutting the main shade strokes first; place the graver point at the cross line A and cut down to B; now begin at C and cut down to E; next reverse the plate and cut the hair lines in direction of the arrows. It would be well for the student not to practice connecting the letters at this time; wait until you can cut them quite well separately before any attempt is made in this direction. When engraving the letters separately the hair line at the right of the lower case letters should come up to the second guide line, except the letter *s*, from which letter, when ending a word, should be minus the hair line at the right, the same ending at line E shown at said letter, plate 13. Letter *b* is engraved by

first cutting from D down to C; from C to E; then, placing graver at the point where hair line crosses main body stroke, cut up to center of loop at D. Now beginning at E, cut hair line around to main stroke of C. To engrave the letter *c*, begin at K and cut down to H; now make cut at the right of the loop up to K, same as described for making similar cut at the end of line of beauty. All shade strokes are made by one cut unless otherwise mentioned. The letter *d* is engraved by beginning at F and cut down to L; next begin at the top and cut down to V; the top is squared up by making the extra cut formerly described. Hair lines are cut in their regular order, beginning at the left and cut in the direction of arrows. The *e* is engraved by beginning at S and cut down to W; next, the line up to S; then the hair lines in their order. Letter *f* is engraved by beginning at R and cut down to the end of main stroke, which stroke is squared up by extra cut; next cut the little loop just below the center of letter; then the line up to R. All cuts are made in directions of the arrows. The letter *g* is engraved by beginning at A and cut down to E; then place the graver at the end of main stroke, and as the tool is pushed forward it is gradually turned up to the left so as to cut a fine hair line just below the first guide line; the cut is continued to the center of the loop; now cut hair lines in their order, being very sure to cut them in the direction of the arrows. Letter *h* is engraved by beginning at the center of loop at top and cut down to end of main body stroke, which is squared up. The lower half of the next or right shade stroke should be cut down while the graver and plate are in the position as when the graver was thrown out at the bottom of the main body stroke; now reverse the plate

and square up the end of the main stroke just cut down, and while the plate is in this position the upper half of the right hand shade stroke is cut up. The manner of cutting this double cut has been described. The stroke forming the balance of the loop at the top is now cut; the hair line over from P is next cut. The letter *i* is engraved by one shade stroke down, the same being squared up at the top. Letter *j* is engraved according to the arrows, and has been described for engraving the letter *g*, a part of this letter being the same. The first part of the letter *k* is engraved the same as *h*, the shade

at the right of main stroke is a double cut, same as in the letter *h*.

Referring to plate 13, engrave the letter *l* by beginning at the center of loop at the top of said letter and cut down to B, turning the graver to the right to make the necessary shade; bring the same up again to a fine hair line and throw it out at B; cut the hair lines in their order and according to the arrows.

The letter *m* is engraved by beginning at the lower end of the first shade stroke and cut the same up to and throw out at C; next cut is made in a like manner; the next is a double cut, and the upper half of same is now cut up, plate reversed and lower half cut; now cut the hair line from C down to B; next, the hair line from D over to where it meets the first shade stroke, which

should be about two-thirds the distance down; next cut the hair line from E down, same as one just cut.

The *n* is engraved same as *m*, leaving off the first shade stroke of *m*.

The *o* is engraved by beginning at center of loop P and cut down to K; next, the hair line up to P, which hair line is shaded a very little as it nears the upper guide line or center of loop.

The *p* is engraved by cutting the main shade stroke down first, same being squared up at both ends; next, and while the graver and article being engraved are in position as graver was thrown out at end of stroke just cut, the lower half of the next shade is cut, the same being a double cut; now square up the top end of main stroke, reverse plate and square up lower end and cut the upper half of double cut, shade up, and hair lines in directions of arrows.

The *q* is engraved, or embodies same cuts as *g*, and the student needs no other instructions than to cut in directions of arrows.

The shade stroke of the letter *r* is cut first; next, the hair line up, and as it approaches the upper guide line, the graver is turned to the right; I do not mean turned over to the right but that the handle is turned to the right, so as to change the course of the line; now as the graver crosses the upper guide line, raise the hand and throw the point of graver in and raise same up, breaking the chip off. This little cut being executed in this manner will cause the shade to expand equally to the right and left of hair line

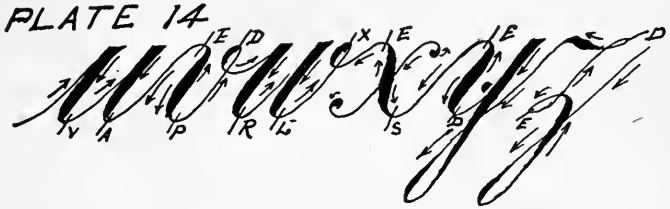
The hair line of the letter *s* is usually engraved first; next cut from cross line R up to where the two lines meet, which should always be at the upper guide line.

The shade at the top and end of hair line is made same as described for like cut in *r*. The end cut E is same as for end of line of beauty.

Letter *t* is engraved by one shade stroke down, same being squared up at top on a line with guide line. Great care should be exercised to cut the shade the same width all the way down. Hair lines are cut in direction of arrows and letter crossed with a fine hair line.

CHAPTER XII.

Referring to plate 14, the letter U is engraved by first cutting the two shades strokes down the same being squared at the top. Now cut the hair lines in their order; the hair line that meets the letter V at the right is usually cut up, but as here shown should be cut down; it is also cut down when connecting with M, N or Y. In engraving the letter V, the main stroke, which is a double cut, is first made by cutting the lower half down to cross line P; now reverse plate and cut from center of



shade up to E. Next cut the hair line from E down to A; now hair line from P up to D; thence hair line to end, which would be where said line meets letter W if not connected, as well as being the end when connected.

Letter W is engraved by first cutting the main body strokes down. In so doing begin at the top and cut down to R; now begin at top of next stroke and cut down to L. The tops of these shade strokes are squared up, the same as the letters *i*, *d*, *t*, *p* and *u*.

The letter X is engraved by first cutting the main stroke; the same being a double cut we first cut the lower half down to S, reverse plate and cut the upper

half up to E. Now cut the hair lines in their regular order. The little shade cut at each end of the cross hair line is executed same as similar cut at the end of line of beauty.

In engraving letter Y first cut the lower half of the first shade stroke, the same being a double cut stroke. Now begin at end of main stroke and cut down to the center of loop; next cut the hair line down forming balance of loop; reverse plate and cut the upper half of the double cut shade up to E; now begin at E and cut hair line down to S; next make little cut at the top of main stroke to square same on a line with the upper guide line; now cut the hair line from D up.

Letter Z is engraved in many different ways and styles. To engrave one here shown, and the one that seems to be preferred by most engravers, we first cut the hair line from E to D; next the top shade stroke over from D. The graver is thrown out at the end of shade and the hair line is continued according to the requirements necessary to make proper connections with the letter preceding it. Now begin at center of the lower loop and cut up, throwing the graver out as it reaches the hair line and continue hair line to center of loop E.

Now that we have completed the technical instructions for the formation and execution of the script alphabet I trust that I may more entertainingly instruct the reader, but before passing the matters now under consideration I wish to say that if you are not sure you understand how to cut each letter as here instructed, that you will make a great mistake if you do not study and practice the details of that particular letter that troubles you, until you have mastered it, before entering upon more difficult work. A very little practice and care-

ful consideration at a time like this will be worth a great deal of time or money to you in the future. Failing to follow this advice which has been given to apprentices for many years by masters of the art, many of our young men have failed to accomplish that which in their early days they aspired to, while those who, when they find a difficult problem do not leave it until they have mastered it, are to-day in the ranks of our most successful business and professional men. With your graver in hand and your plate on which you are practicing on your pad and the alphabet and instructions for engraving same before you, follow the instructions to the letter, and a very little earnest work will surprise you in sequel and that which otherwise would be, or appear to you to be, very perplexing, would be but a few hours of time profitably and entertainingly spent. Never fail to refer back to the illustrations or instructions when in doubt; such reference made a few times even, when necessary, will result in mastery. The student should so thoroughly study his instructions that he can remember the correct manner of engraving each letter without aid of instructions, but as before mentioned, never fail to refer back when in doubt.

Having learned to engrave the letters of the alphabet separately, we now find that we are indebted to our advancement to the extent of consideration of the manner of designing and engraving names. Referring to Plate 15 we here have the name Henrietta. At Fig. 1 the name is designed ready for engraving. When engraving a name like this, engravers usually cut all the down strokes first, but I finish the capital letter first and then proceed to cut all the downward shade strokes. First engrave the letter H, then cut all the shade strokes

down as shown at Fig. 2. Great care must be exercised to make all the cuts on same angle and same width. Now reverse the plate and cut the first shade stroke of the letter *n* up and the upper half of the second shade of the same letter. Now go back to H and cut hair line from said letter up to E; now the loop at the top of E; reverse plate and cut hair line down from top of *n* to bottom of *e;*

PLATE 15

Fig. 1.

Fig. 2.

Fig. 3.

next the other hair line of same letter down. The student will please note that these lines are cut down while hair lines are usually cut up; the reason for cutting these lines down instead of up is that a curve can be made more easily and accurately turning to the right than by turning to the left and it is much easier, and by far more practical to commence a fine hair line to accurately connect with the end of a shade stroke by executing the lines referred to in this manner. Now cut hair line up forming a part of letter *r;* next the hair line up to *i* from

bottom of *r;* next cut the loop at the top of *e;* now hair line from said letter up to *t;* next hair line to the next *t;* now the hair line to *a* and the hair lines finishing the letter *a*. Now finish the top of *r* and cross the letters *t* with a fine hair line half way from the upper guide line to the top of said letters; next dot the letter *i*, which is done by holding the graver upon an angle of about 25 degrees and push same directly downward very lightly, so as to make only a very small dot; the graver is thrown from this position the same as when engraving letters except that it is necessary to give the tool a quicker upward movement. A period is made in the same manner. The student will note that the lower loop at the left of the letter H is left off when said letter is connected with other letters. All letters ending with a loop of this kind are treated in a like manner, and it is a manifestation of poor art judgment not to do so. We sometimes see on a Swiss watch cap a name engraved in this way, i. e. leaving the loops mentioned on letters when connected, and the same is noticeable at once even though the work have been done with much skill. Letters ending with a loop where same is left off when connected with lower case letters are the following: A, H, K, L, M, R, U, X and Z.

The name under consideration when finished will appear as shown at Fig. 3. I again find it my duty to apologize for the inaccuracy of these illustrations, hoping to impress upon the student's mind the fact that if the same were engraved instead of etched they would be much more accurate.

The reader will note that in spacing at Fig. 3 the letter *r* is closer to the letter *n* than the first letter *t* is to the second one; the reason for this is that a part of the letter *r* is

a hair line, while in the other letters mentioned the hair lines do not go up near enough to the upper guide line to consider same in spacing, and the main stroke being a heavy bar they must have more space in order to appear symmetrically. The same difference exists and same allowances are required between the letters *e* and *t*, and *t* and *a*.

The student will comprehend at a glance when designing, where these departures from what would be by some considered logical rules for spacing are required, by the example here given, if he will give same the requisite deliberation and proper application.

CHAPTER XIII.

There are no definite rules for spacing script letters, but we can form some idea from the design of the name Henrietta, Plate 15, they should be so arranged as to appear symmetrically. See that they do not look crowded, or too far apart.

In engraving initials on tea spoons of the many styles and shapes that are now made and come to the engraver to be engraved, is a matter that we should very carefully consider. Comprehend at a glance the difficult and irregular space and advise your customer of the style of lettering most appropriate, and thus enable easy and satisfactory execution. Often customers want three initials engraved where one would look much better, and if the case is explained they will invariably avail themselves of advice given, and we are often asked to engrave a full name where three initials would, for lack of space present a more satisfactory appearance, all these apparently minor details are of vital importance, and the young artist should look to them with much care.

In the beginning of these articles we were instructed how to design on metal with a dead or satin finish, and were to later consider the same work on polished metals, I use for designing on polished metals the same wax used for transferring. Some engravers only rub their fingers through their hair and then pat the article with index finger, which will carry enough oil from the hair to deaden the high polish sufficiently to permit making a very plain design through

same with rubber marker, but, as it is no more trouble to use the wax referred to, I consider it best.

The ingredients for making the wax above referred to are as follows: Three parts beeswax, three parts tallow, one part Canada balsam, and one part olive oil. Any pharmacist will make up this formula for a few cents, in quantity sufficient to last many years. If found too soft, more wax should be added, if too hard add more oil. A glass jar about two inches high and one and a half inches in diameter, with a metal top screw on same, which your druggist will furnish, makes a very convenient mode of keeping the wax. On all

Plate 16.

highly polished articles this wax should be used, and is applied by putting the finger on wax in jar and applying same to article to be engraved in like manner; now if a piece of pegwood is sharpened to a fine point, you will be able to sketch through the wax to the polished surface, and owing to the contrast between wax and said surface, the sketching will be nearly as plain as black on white.

A hard rubber marker is far better than the pegwood. The style I use, and the best that has come to my notice, is the one shown in Plate 16, one end of which is steel, and same is very valuable to the engraver, which valuation will be considered later.

This rubber marker is known as "Duplex Tracer," cost of which, including a very useful steel straight

edge, is only fifty cents, and no engraver can afford to do without one. I am informed that the material houses do not handle them, but the maker, Mr. Adolph Muehlmatt, Cincinnati, Ohio, will sell them at retail. The beginner may say, I can do with ivory or peg wood, or even a lead pencil for a marker; true, but never do with anything but the best when it is a matter of only a few cents, or you may soon note, from proficiency of your neighbor's work, that you are not up to date, either in work or mode of and tools for execution of same. Carefully study the merits of the new things and avail yourself of their advantages. It is only a few tools that are required, and the wise student will equip himself with the best. There are many tools made for engravers of which I do not approve, and I will only mention those that I know from experience to be advantageous.

While we have under consideration the transfer wax, used as a designing wax, we may as well consider the process of transferring initials or a name from one article to another. We will suppose a customer brings to us a dozen teaspoons to be engraved with a name. We first engrave the name on one spoon; now we want all the others exactly the same, and in same location as on said spoon. To do this take a small quantity of the wax from jar on point of a knife and put same on name engraved and with index finger rub the wax in the incisions. The surface of the spoon should be rubbed off as clean as possible, avoiding any danger of rubbing wax out of the incisions. Now take a small piece of good writing paper and moisten same by placing it between the lips; now place this piece of paper so dampened

on the spoon over the name, using some point on the handle for a guide for one end on paper and allow the edge of paper to be placed evenly with edge of spoon handle. If the spoon is a fancy design, similar to Gorham's "Luxembourg" pattern, one of the scrolls terminating on or near edge of said spoon can be used as a guide. Now place a dry piece of paper over the wet one and holding same down firmly with thumb and index finger of left hand, carefully burnish (with a jeweler's hand burnisher), being very cautious to go over all the design. This operation will press the dampened paper down in incisions of the engraving. Now remove the dry paper, and then with a point of a knife lift up one end of the wet paper and carefully peel same off, and you will find very a clear and prominent impression of the engraving, which is capped with the transfer wax. Now, if this paper is applied to all the other spoons the same as the first and the index finger very gently rubbed over same to press the impression down on the surface of spoon, you will find, by lifting up impression paper, a very clear imprint of the engraving transferred to the spoon. If this operation is carried out as directed and with adequate precaution, you will find no difficulty in making one or two dozen impressions. Impressions are transferred from all pieces of jewelry and silver in this manner, and it matters not what the design may be. Monograms, crests, coat of arms, fancy initials and ornamental engraving, may be easily transferred in the same manner.

For articles with satin finish, as is found on large pieces of plated ware, the impressions can be made more clear by adding a very small quantity of red vermillion.

There are many different ways of taking impressions, but as the one above described answers all purposes best of any, to my knowledge, and same being very easily applied to all articles that the engraver has to inscribe, it is with pleasure that I recommend same to all students in the art.

CHAPTER XIV.

One thing that causes the beginner much trouble in engraving script initials, is to engrave in a scroll on front case of a small watch. He may be able, as many engravers are, to only engrave this style of letters, or if he is a general letter engraver he may be asked, as engravers often are, to engrave script initials in the space above mentioned. The reader will say, if a beginner, I must engrave the letters on an angle of 45 degrees, and small enough to enable me to design the three letters in the space given. Not so. We have now arrived at a stage in script lettering where we must depart from those set rules for executing this style. When applied to articles and spaces as mentioned, study and consider the shape and scope given, design and so arrange our letters to correspond with such scope and shape. For illustration, please note Fig. 1, Plate 17, where is deliniated a scroll similar to one of the hundreds of irregular ones that are engraved or stamped on articles that come to the engraver to be inscribed. We will suppose our customer wants engraved in script in the space the initials E. F. R. It will be readily seen that if we endeavor to design the letters of size appropriate to size of space, and the same be given the regular angle, we would scarcely have room for two of the letters, consequently the only remedy is to design the letters nearly, if not entirely perpendicular. This method will obviate the intricacy above referred to, and will harmonize with space. If we were at this period a monogram engraver we would no doubt advise a monogram, but if that were true, it is probable that our

customer would want the initials separate, and not entwined in a monogram, as would best please the convenience of the artist.

Intelligent and earnest consideration of the space in which we are to engrave initials or a name, before operations are commenced, are of vital importance, and the sequel of this forethought will be that we please our customer and find our work executed within the laws of logic. There are hundreds of irregular spaces that I might explain, but from the one here mentioned, and the

PLATE 17.

Fig. 1

Fig. 2.

comprehension of a studious pupil, I have no doubt but that the correct modifications and appropriate applications of the shape of letters now under consideration will be made at the time when required. There are many styles of entwining script capitals in odd ways, including hanging, diagonal forms, which we will conconsider under the heads of ciphers and monograms.

The engraver of today is asked to inscribe articles that the old time engraver would say could not be done, but as the art has advanced, and competition increased, the masters of the art have so equipped their benches as to enable them to engrave any article that comes to them, with accuracy and precision. At Plate 18 are shown some of the tools designed for executing work on such

articles as referred to above. At Fig. 1 is shown the end of a square bent graver. This graver is one of the most useful of all bent tools; it will be found invaluable for engraving inside a fruit dish, cake dish, trays of all descriptions, and in fact all irregular shaped pieces where the place to be engraved is lower than surface or border, or where any part of the piece extends above plane of inscription. Many of our best engravers use a straight graver for engraving inside of rings; they have

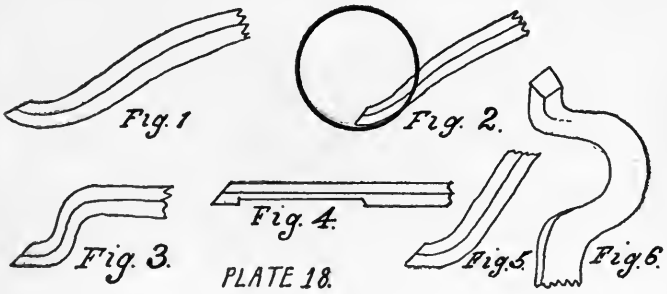


PLATE 18.

by long experience become so expert that they can wield the tool in this connection with dexterous precision. It requires much more time to learn to use the straight graver for this purpose, and even then it is not practical to connect the letters as accurately, if on the correct angle, as it would be if we use the graver shown at Fig. 1. I have used both. I first learned to use the straight tool. I find the one here mentioned much more convenient; the work can be done easier and curves made more gracefully. At Fig. 2 we have deliniated the bent tool as it would appear in a ring ready to commence a letter. The reader will note that the graver is so bent at, or near the end, as to correspond with curve

of the ring, and will therefore comprehend the expediency of its use for this purpose, and a trial will confirm the same. The cardinal difficulty in using the straight graver is that in making curves the tool will strike edge of ring. This is obviated to a great extent by using the bent tool. At Fig. 6 is shown another style of a bent graver for ring work. Some engravers use this graver exclusively, but I can only recommend it for making hair lines where the regular tool can not make a perfect connection and for crossing the letter T and making such other hair lines as can be made with it advantageously.

The student should cut all the letters inside the ring with the graver shown at Fig 1, and such hair lines as he can not make connect with the body stroke by use of said graver, he will find he can bring the graver shown at Fig. 6 in to play with perfect results. In making the line of beauty the last mentioned graver should be used for cutting said line down, then it is laid down and not used until the work is completed as far as can be with the tool shown at Fig. 1. After the hair line of beauty is cut down with graver Fig. 6, it is shaded up with graver Fig. 1. Some names will not require the use of the graver bent to the right, but in most capitals it is found valuable for touching up or connecting up hair lines. At Fig. 5 we have delineated a graver bent for work down in a bon bon dish, bread tray, fruit dish or any article where work is to be executed in a deep indentation, deeper than referred to for graver shown at Fig. 1.

At Fig. 4 is shown a straight square graver cut out on the under side nearly to the point, to permit its use for engraving over borders, etc. This tool will be

found a very useful one, in fact quite necessary in some classes of work, it can be used for engraving inside a watch case, and is used by some engravers for inside ring work. For small silver hair pin and button trays it can be used far better than a bent tool, as it permits engraving closer to the edges than a bent tool.

At Fig, 3 is shown the well known bayonet graver, same is used for such work as mentioned for graver at Fig. 4, when the surface to be engraved is so deep that said tool can not be used, it is also used for engraving inside the bowl of spoons. Such a tool, made square, flat and half round are the tools used for engraving all styles of letter and ornamental work, including buildings, inside the bowl of spoons. With a tool made in this shape, ground back close to the first bend, the beginner will find he can use it for purposes mentioned as dexterously as the straight tool on a flat surface.

With the tools above mentioned the student will find it an easy matter matter to engrave script letters on or in any article that may come to him to be engraved. The instructions given for preparing the straight square tool for engraving applies to those here mentioned, except they are not ground on the under side; they should be whetted perfectly flat on the under sides, being very cautious not to round same at or near the end. These bent tools are quite difficult to hold when whetting and polishing, therefore the student should not be discouraged if success does not crown his first efforts. Practice will make perfect in this case as well as in all others, and after using bent gravers a short time you can put it in order as quickly and easily as a straight one. Never put a graver up until it is in perfect condition, then when wanted it is ready.

CHAPTER XV.

The engraver of a few years ago did all of his work on a sand bag pad, and was content with his equipment and today many expert engravers cast askance glances at some of the many labor saving and convenient improvements made in engraver's tools and say the pad was good enough twenty years ago, and it will answer just as well now. It is true it may answer his purpose well enough, as he has had so many years' experience that he could cut a fine monogram by holding the article in his hand, but he could not do it as quickly nor perfectly as he could should he use the pad, and he would find, should he investigate the merits of modern engraving blocks, and avail himself of their advantages that he could wield the tool in executing the work much more easily, rapidly and accurately. The inventive minds of our thinking men seem to have deliberated to some extent on the subject of a device for holding articles while being engraved, and the sequel of their deliberations and experiments is a most perfect article for this purpose, covering the entire scope desired.

At Plate 19, will be seen the Monarch engraving block, No. 1, with base and standard. To the right is shown base, standard and head of block separated from each other; the figure at the left is an axial section showing said parts fitted together and the standard locked to the base. To the student not familiar with the many valuable features of a block of this kind, I would state that the base of the block is round and fits into a circular pad as shown at Plate 21 to enable the operator to turn the head of block to right or left at any desired

angle, thus enabling him to get any light or shade on the work in operation. Polished pieces placed in a block without a ball base, receive the light so it is quite impossible to see a sketch, or more probable an impression, and it is therefore necessary for the engraver to turn his head to the right or left to obviate this difficulty with a block that turns on a flat base, but with the ball base block the work is easily turned and

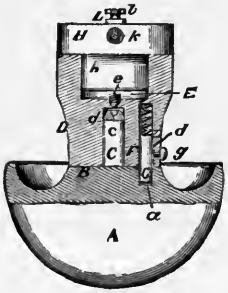


Plate 19

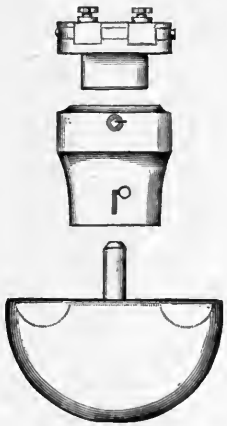


Plate 20.

adjusted as desired. The head turns on a pivot extending up through the base; the same is adjusted at any height by a key which operates on a set screw holding said pivot firmly at height desired.

Noting the axial section at Plate 19, the reader will observe the pin *d* locks the head to the base, said pin is raised to unlock by raising the slide *g*, which, when turned to the right, allows the head to again revolve on pivot. The object of this locking device is obvious to the engraver. It may be well to state, for the benefit

of the pupil, that in some classes of work where same is ornamented by the chasing tool it is quite necessary that the article be held firmly. The locking and unlocking is done so quickly that the device can not do otherwise than commend itself to the craft. It is also very useful in die cutting and other classes of engraving.

Plate 21.

Plate 21 shows the Monarch No. 2 and Plate 22 the attachments. Plate 23 shows the Monarch No. 1, which has some modifications in shape and other features. So completely does the cut illustrate the value of said block that any comment on it would seem unnecessary. I may add, however, that with this block all articles that can be engraved in a block can be held

firmly by the aid of the attachments. The young engraver will find many small articles that owing to their size, shape, or thickness, or from the fact that they are enamelled, have to be cemented on a small block of wood or piece of brass. Such cement blocks are placed in the head of the block, a large hole under the carriage for pins being made expressly for this purpose. The

Plate 22.

cement block has a large pivot made to fit said hole, and the center key square is to hold same in place as it does pin carriage shown in our illustration. No pupil anxious to excel or even master in the art, should try to do his work with a cheap block. The best blocks have been reduced in price within the reach of all. There are several blocks made that are, as they manifest themselves to us, models of perfection, and as we proceed we will illus-

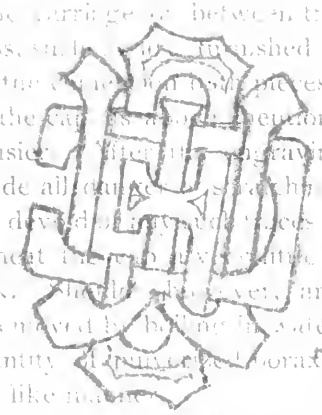
trate the points of valuation and improvement of same and briefly consider them. Any material house will furnish the student with a pound cake of cement for engravers' use for twenty-five cents. If we have a gold watch cap to engrave, we remove same from case, turn convex side down, and with a little oil thinly coat the concave side; now with alcohol lamp heat cake of cement and run enough of same in case to fill it; let it cool. Then having coated our cement block, size of one above mentioned, or one same diameter as case (it is a capital idea to have all sizes on hand) which size can be held with pins on the carriage or between the carriage jaws, if one of brass, such as are furnished with some blocks. Now heat the cement on both pieces and press together. We oil the cap, as above mentioned, so the wax will remove easier. After the engraving is complete, we should evade all danger of scratching the case, assuming same to be devoid of any such traces of "would-be-workman;" we heat the cap a very little and it will drop off the block. Should, however, any cement remain, it is easily removed by boiling in water to which is added a small quantity of pulverized borax or alcohol alone can be used in like manner.

The cap is now polished a *very* little, and the work is complete. Should for any reason the case become scratched or marred, the polishing requisite necessarily becomes enhanced, and it is best in such sad cases to do the polishing when on cement block. Engravers often have enamelled tea spoons to engrave. Such spoons are held on the pad turn table formerly described. The enamel being very brittle, it would be very hazardous to place one in a block unless cemented; that would entail some work, and unless the amount of work to be

executed is more than ordinary the expediency of the former mode is manifest. The engraver is often called upon to engrave a monogram on the outside of a flat band ring. The engraving blocks herein mentioned have a very practical device for holding rings for such work, thereby avoiding the necessity of cementing. All engraving inside of rings should be done by holding

ring between thumb and index finger, bringing same down firmly on the pad. The engraver should make several sizes and shapes of pattern tools to be used on engraving blocks, as they are considered a necessary equipment ready for use. Included in box of attachments accompanying all the best engraving blocks will be found an attachment for holding collar and cuff buttons which is practical, and the work is adjusted in a few seconds.

trate the points of valuation and improvement of same and briefly consider them. Any material house will furnish the student with a pound cake of cement for engravers' use for twenty-five cents. If we have a gold watch cap to engrave, we remove same from case, turn convex side down, and with a little oil thinly coat the concave side; now with alcohol lamp heat cake of cement and run enough of same in case to fill it; let it cool. Then having coated [illegible] cement block size of one above mentioned or [illegible] diameter as case, it is a capital idea to have [illegible] sizes on hand which a size can be held with pliers [illegible] carriage or between the carriage jaws at one of brass, [illegible] finished with some blocks. Now heat the [illegible] pieces and press together. We oil the [illegible] mentioned, so the wax will remove easily [illegible] engraving is complete, we should evade all [illegible] scratching the case, assuming same to be [illegible] pieces of would-be-workman: [illegible] heat [illegible] and it will drop off the block. [illegible] any cement remain, it is easily removed by [illegible] water to which is added a small quantity [illegible] borax or alcohol alone can be used in like manner.



The cap is now polished [illegible] and the work is complete. Should for any reason the case become scratched or injured, the [illegible] necessarily becomes enamel [illegible] to do the polishing [illegible] engravers often have enamelled tea spoons to engrave. Such spoons are held on the pad turn table formerly described. The enamel being very brittle, it would be very hazardous to place one in a block unless cemented; that would entail some work, and unless the amount of work to be

executed is more than ordinary the expediency of the former mode is manifest. The engraver is often called upon to engrave a monogram on the outside of a flat band ring. The engraving blocks herein mentioned have a very practical device for holding rings for such work, thereby avoiding the necessity of cementing. All engraving inside of rings should be done by holding

Plate 23.

ring between thumb and index finger, holding same down firmly on the pad. The engraver should make several sizes and shapes of cement blocks to be used on engraving block and have same mounted with cement ready for use. Included in box of attachments accompanying all the best engraving blocks will be found an attachment for holding collar and cuff buttons which is practical, and the work is adjusted in a few seconds.

Other small articles, such as pegs, round, concave and triangle shape, included in attachments, will be found useful for holding hundreds of articles not necessary to cement.

The round head pegs are used on Monarch blocks for holding spoons. Another manner of holding spoons is used on a block to be mentioned and illustrated in a subsequent article.

After engraving a spoon, or any polished article, it is wiped off with a soft chamois or a towel. In many cases it is not necessary to polish such article at all, wiping off the wax as mentioned will suffice. Should the beginner do any polishing it must be remembered that as little as possible be done, and that very lightly. Too much polishing will make the sharp cuts appear rounding and destroy the effect of the work.

CHAPTER XVI.

Designing and engraving Roman letters is considered quite difficult by most engravers. The reason for this opinion is due, no doubt, to the fact that they do so little of this class of lettering that they are not familiar with the formation, spacing and manner of cutting them. Roman letters are easily executed by the engraver that has occasion to use them to any extent. The student will find this style of letter in any good text book. Engravers as well as students in the art are very observing of good specimens of lettering, but when notice has been made of such specimens and the style is of Roman or a similar style, and the same was from type, it will be noticed that the spacing is dissimilar to what the the engraver would consider correct, especially noticeable when the letter T and A or A and V are together. It is necessary that this should be so when said letters are printed from type. It will be noticed that the spacing will appear, and in fact is greater than the sign painter or engraver would allow. The necessity of this irregular spacing will be understood when we understand that such letters are set up on a little block, each block containing a letter. A type letter A and V, are mounted on blocks of nearly same width, and must be so mounted, as each letter is nearly same width, but from the fact of one letter being wider at the top and the other the reverse, would indicate the fact that the space between the two shades or body strokes would be greater than would be allowed could it be obviated.

In engraving we can space our letters as they should be, not having the above difficulties to contend with.

If the reader will notice the word engraving printed from type in capital Roman letters, (capital letters are the letters referred to above), he will observe that the letter A and V are given more space between them than any of the other letters; the necessity of same is obvious

Fig. 1

Fig. 2.

Fig. 3.

Fig. 4.

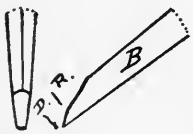


Fig. 5.

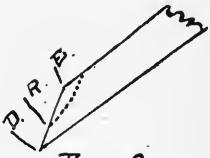


Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Plate 24.

from the above explanation. If we were to engrave this word we would sketch these letters so they would appear, when cut, as shown at Fig. 1, Plate 24. At Fig. 2 we show the same letters as they would appear from type. The dotted delineations at Fig. 2 indicate the block on which letters are mounted. The letters shown at Figs. 1 and 2 are made as they would be if to be engraved large size by swelling the heavy bars at the top and bottom, but if we were engraving Roman letters very small we would add hair lines at the top and

bottom, as shown at Fig. 3. These hair lines are cut by beginning on the bar and cutting in each direction. It would not be practical to make said hair line by one cut, as the end, where the graver was inserted, would be pointed, while the end where the tool was thrown out would be blunt. The latter being required we must proceed as mentioned.

To make the shade strokes or bar swell at top and bottom, we show a grotesque shape of such stroke at Fig. 4, and as there delineated and exemplified by arrows, the cuts D and A are cut in direction of said arrows; the dotted lines show where the next cut will locate. This swell of the bar in question can be enhanced or extenuated by the width and angle of cuts D and A. These cuts are similar to the cut we use to square up the top of letter I and T in script engraving. Great care must be exercised to make these cuts accurately meet, and same must be cut on the guide line. Some engravers use another method of making this swell, but as the one here mentioned is considered best, and in view of the fact that the mode referred to will be applied to block letters for a like purpose, we will not mention it at at this period.

In designing letters, and more particularly the style now under consideration, we space off in the scope in which the word or words are to be engraved, by making small dots on or directly under the lower guide line, allowing sufficient space for each letter between each dot. If after so spacing we find we have not made the right calculations it is an easy matter to allow more or less space as may be required, and space it again, but a little practice is all that is required to be sanguine of correct results the first time. The bar of Roman letters is cut

in many different styles. The first for us to consider is the one cut with a flat bottom graver. An end view of such graver is shown at Fig. 5, Plate 24; a side view of same is shown at B, showing the tool after it is sharpened and ready for use. The reader will please notice that the front or end of graver is ground with two angles, the second angle being to lessen the amount of whetting necessary to sharpen the cutting edge. It will be noticed that should we grind the graver off the entire width on an angle of 45 degrees, as shown from D to E, Fig. 6, it would be necessary to whet the scope of metal from D to E, while if when putting tools in order we grind off the metal from R to E, as delineated by dotted lines, Fig. 6, it would only be necessary to whet the metal from D to R, and at same time we will have a much more graceful point and one that represents many points of advantage in certain classes of work that will come to the engraver. The flat bottom graver is not ground off on the bottom to raise the angle of same for convenience of the operator's hand on very small tools, such as we would use for a watch case, but the rule for such grinding applies to flat bottom tools, same as mentioned for the square graver. The graver should be ground to suit the work required of it; for illustration, if we have a large tray to engrave, the graver should be ground off on the under side sufficient to permit the operator's hand to gracefully grasp it and glide over the metal.

The proportions of Roman and block letters are a very important item, and yet one quite difficult to elucidate with a pen, but I think if we consider the proportional sizes of these letters on a scale of an inch high, the student will be able to reduce them proportionally. If we

design our letters, for example, one inch high, the letters B, F, D, O, G, P, Q and T, will occupy a one inch [redacted], while A, H, K, N, R, U, V, X and Y, [redacted] space one-sixteenth of an inch wider, and [redacted] and Z, one-sixteenth narrower than an inch [redacted]nd W will occupy a space on scale men[redacted], one and three-sixteenths of an inch. The [redacted]ld occupy a one-half square.

[redacted] of letters above mentioned is about four [redacted]e that a general letter engraver would have [redacted] For cutting the bar of Roman letters, if on silver with satin finish, the best effect is obtained from a polished graver. If we are cutting block letters, a very [redacted] effect is obtained by first wriggling. By wrig[redacted] student is to understand that the flat bottom [redacted] held in the hand so as to cut the bar, except [redacted]ot on as much angle, and as it is pushed [redacted]ently, it is very carefully and accurately turned [redacted]d left, or in other words is given a rocking [redacted] Wriggling is beautiful if well executed and [redacted] properly. After wriggling the letters above [redacted]ed, a bright cut is made on the lower right side [redacted] letter; the width of this shade varies according [redacted] artist's judgment or the requirements, and is [redacted]ith a flat bottom tool, highly polished, and at least [redacted]rd wider than the cut to be made. Wriggling [redacted] done with any flat or round bottom tool, and the fineness of the wriggling is governed by the angle on which it is held and the force with which it is pushed forward. At Figs. 7, 8 and 9, we show wriggling of different degrees of fineness, all executed the with same graver; changing the angle of the tool in operation makes the lines appear finer or coarser. By raising the

in many different styles. The first for us to consider is the one cut with a flat bottom graver. An end view of such graver is shown at Fig. 5, Plate 24; a [illegible] same is shown at B, showing the tool after [illegible] ened and ready for use. The reader will p[illegible] that the front or end of graver is ground with [illegible] the second angle being to lessen the amou[illegible] ting necessary to sharpen the cutting edge. [illegible] noticed that should we grind the graver off [illegible] width on an angle of 45 degrees, as shown [illegible] E, Fig. 6, it would be necessary to whet the [illegible] metal from D to E, while if when putting tools in order we grind off the metal from R to E, as delineated by dotted lines, Fig. 6, it would only be necessa[illegible] the metal from D to R, and at same time we [illegible] much more graceful point and one that repres[illegible] points of advantage in certain classes of worl[illegible] come to the engraver. The flat bottom gra[illegible] ground off on the bottom to raise the angle o[illegible] convenience of the operator's hand on very s[illegible] such as we would use for a watch case, but th[illegible] such grinding applies to flat bottom tools, same as mentioned for the square graver. The graver sh[illegible] ground to suit the work required of it; for illu[illegible] if we have a large tray to engrave, the graver [illegible] be ground off on the under side sufficient to per[illegible] operator's hand to gracefully grasp it and glide [illegible] metal.

The proportions of Roman and block letters ar[illegible] important item, and yet one quite difficult to e[illegible] with a pen, but I think if we consider the proportional sizes of these letters on a scale of an inch high, the student will be able to reduce them proportionally. If we

design our letters, for example, one inch high, the letters B, F, D, O, G, P, Q and T, will occupy a one inch square space, while A, H, K, N, R, U, V, X and Y, will occupy a space one-sixteenth of an inch wider, and C, F, J, L, S and Z, one-sixteenth narrower than an inch square. M and W will occupy a space on scale mentioned above, one and three-sixteenths of an inch. The letter I should occupy a one-half square.

The size of letters above mentioned is about four times the size that a general letter engraver would have to engrave. For cutting the bar of Roman letters, if on silver with satin finish, the best effect is obtained from a polished graver. If we are cutting block letters, a very beautiful effect is obtained by first wriggling. By wriggling the student is to understand that the flat bottom graver is held in the hand so as to cut the bar, except possibly not on as much angle, and as it is pushed forward gently, it is very carefully and accurately turned to right and left, or in other words is given a rocking motion. Wriggling is beautiful if well executed and applied properly. After wriggling the letters above mentioned, a bright cut is made on the lower right side of each letter; the width of this shade varies according to the artist's judgment or the requirements, and is done with a flat bottom tool, highly polished, and at least one-third wider than the cut to be made. Wriggling can be done with any flat or round bottom tool, and the fineness of the wriggling is governed by the angle on which it is held and the force with which it is pushed forward. At Figs. 7, 8 and 9, we show wriggling of different degrees of fineness, all executed the with same graver; changing the angle of the tool in operation makes the lines appear finer or coarser. By raising the

hand up and turning or rolling the tool right and left, quickly and gently, the fine work is done, and as the hand is lowered and turned to the right and left a little farther the wriggling becomes coarser. The student should practice a great deal at this class of work, as it is very useful if well done, but if executed poorly is one of the most abominable manifestations of sin applied to engraving. The graver should be rocked evenly and the pressure forward should be kept the same, thus assuring evenness of the wriggling.

When wriggling with a half round graver, the incision is first cut with the same graver that the wriggling is to be done with, thus making easy the accuracy of wriggling. It is not necessary to do so with the flat tool, but in letter engraving it is often done, to sink the work so deeply that it will not be subjected to wear. The heavy bars of Roman letters are wriggled with good effect if on polished metal and the wriggling is very fine.

Roman, block, and gothic letters are very effectively executed on metals having a satin finish by cutting them with a flat bottom tool that is perfectly polished.

Gothic letters (commonly known as block) are very much improved by squaring up the beginning and ending of each letter with a flat bottom graver a very little larger than the one used to cut the letter. To execute this cut we use the graver nearly the same as we do the square graver to square up the top of a script letter i or t, except that we begin the cut a little to the left of the bar to be squared and push it forward so as to make it lap over on the other side of the bar exactly the same as it does on the other side where we begin. By following this method we square the ends of the letter, giving the bar a swelled appearance, and all is

done with one cut. It is, of course, not necessary to add this cut to the gothic or block letters, it being optional with the engraver; by adding it we make in one sense another style of letter. Should we wriggle the letter first and then bright cut it the letter could then be squared up in a like manner.

CHAPTER XVII.

There are many styles of block letters, all of which are of the same general form, and the rules governing the manner of cutting any one of the styles referred to will answer largely for all. Block letters, as well as Roman, are shaped to conform to the shape and size of article to be engraved. The proportions of block or gothic letters are the same as Roman. Either style of letter presents the most artistic appearance if designed (if the letter for illustration be R, B, D, or any letter of same dimensions) same width as height, or, in other words, perfectly square. At Figs. 1, 2 and 3, Plate 25, is shown the letter B, designed on this scale in Roman, gothic and block styles.

The letter B, shown at Fig. 1, is to represent the letter either bright cut or cut out with fine hair lines laid very closely together. To more fully explain, we show at Fig. 4 the letter D, with the lines separated so as to leave enough surface to give the reader an idea of the style of cutting. The lines are to be cut so closely that the surface will be entirely cut away. The effect of work executed in this manner is very beautiful if accurately done, and should be engraved with a square graver, as it comes from the oil stone, when engraving on polished metals. Many beautiful specimens of work done in this manner will be seen on watch caps and polished silver prize cups. This style of cutting is applicable to Roman, block, both plain and fancy, old English, German text, and other fancy letters, but the student must bear in mind that letters of whatsoever style cut with the fine lines must be executed

very accurately. Avoid one line running into another and cut all same width.

To engrave the letter B of the Roman style (we use this letter as its form covers the necessary strokes and curves to answer for other letters of the alphabet), we select a flat bottom graver of the same width as the body stroke of the letter we wish to engrave. The body stroke of the letter B is first cut; the balance of the letter can be engraved with same tool, but most engravers use the square tool, as it can be used more advantageously. Now place the point of the last mentioned tool at C, and cut a hair line out until the turn upward is made, and at this point gradually turn the graver over to the right as it is pushed forward to execute the proper width of shade, which at the widest point should be the same as the body stroke. After reaching the center of this curve the tool is turned up gradually until reaching the horizontal line at the top, at which point the graver should be in position to cut a hair line, and this is continued to the end of the line at B. Beginning again at A, the lower portion is cut same as the above. The shades thus cut will have an angular appearance, which is not permissible and must be obviated. This is easily done by cutting a fine hair line around the right edge of said shade stroke at K and D. Great care should be here exercised to evade any possible chance of permitting the hair line so cut, to, at any point be cut to the right of where the angle of cut and surface of metal meet. If the line mentioned is accurately cut, as above mentioned, it will give the angular shade a sunken appearance, or, in other words, the incision will appear flat, as it would if cut with a flat bottom tool, were the cut of the same width. The body strokes of one style of Roman letter

swell near the top or bottom of guide lines. The letter shown at Fig. 1 is complete for the style when the shade strokes do not swell, which is the style most commonly used for very fine lettering. Should you desire to swell the body stroke, it is done by making the little extra cut mentioned for that purpose in a previous article and shown at Fig. 4, Plate 24.

The letter B, Fig. 2, which is known as block style contains the necessary bars and curvatures requisite for

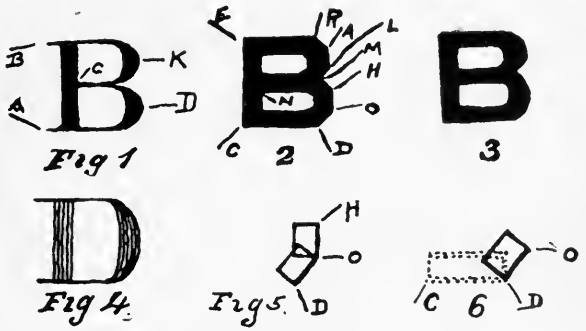


Plate 25.

the formation of the remainder of the letters of the alphabet, we will therefore consider engraving it. I would recommend this style of lettering for inscription work. I mean, of course, to be used in connection with other letters. For illustration, for a small inscription we would use script, old English and block, using the former mostly and the latter for short lines, and the English for the name, etc.

Letters of this style are usually engraved with a flat graver; the lining graver is also used advantageously on cheap work to imitate the fine lining executed with a square graver. Flat bottom gravers should be kept in

perfect order. Never permit the corners of cutting edges to get rounding. It is much easier to heel up a graver occasionally than to erase a superfluous cut some time when you are in a great hurry.

Probably the greatest obstacle to encounter in engraving block letters of the style now under consideration, is to turn the sharp corners neatly; however, if we start right and will go about it carefully and with a determination (which is the key to success in all high class work), we will master the now apparent difficulty.

Referring to Fig. 2, B is engraved by first cutting the perpendicular stroke up from C to E. We next cut the top loop, as by so doing it will answer as a guide for cutting the lower one. We begin by placing the graver at the right of the stroke just cut, as indicated by line N, and cut out to corner M. At this point some engravers throw the graver out, breaking off the chip. I can, however, see no necessity of so doing, in fact, I think it a better mode of procedure to, when arriving at the point above stated, or any similar one, to merely raise the graver handle slightly and turn graver over to the right, allowing it to remain in the incision, resting on the right corner or point of its cutting edge. Now the graver is turned around to the right, the point of the graver acting as a pivot. When the tool is turned sufficiently to be in line with preceding stroke, it is turned back to the left, so as to permit the cutting edge to rest flat on the bottom of the incision.

Now we are ready to proceed, and as we do so the graver must not be pushed in deeper or allowed to cut a more shallow incision, but pushed forward on the plane of beginning. It will be noticed that by cutting these turns in this way, we are sure of making a clean

cut, as there has been no necessity to, neither has the entire cutting edge of graver been removed from the incision. The right corner of the flat bottom tool having remained in its incision while the graver was turned, it is therefore now, when the graver is again turned so that the cutting edge is flat, in same position and acting as a guide and pivot. A corner of angular strokes can be cut more accurately and rapidly in this way than could be done by throwing the graver out and then turning the work and again inserting the tool in the incision before we ready are to proceed. The danger, especially to the novice, in cutting in the manner last mentioned, is that he is not apt to place the right corner of the graver exactly where it was thrown out. Of course, an expert engraver would not experience the danger here mentioned, but that does not change the fact of an existing tendency of the student to make a slight protuberance at such points. Therefore, in view of the fact that the former mode is more expeditious, easier and conducive of cleaner cutting, the expediency of following it is manifest. When cutting block letters on soft metal on a very large scale, it is well to throw the graver out at each corner, if we are using a flat tool. The instructions mentioned above have reference to small lettering.

The cut is continued up to the corner, L, where a like turn is made, and so continued around to E. The graver is next placed at C, and continued as above directed around to M, which completes the letter. When cutting up to the line or incision at M, formerly cut, great care should be exercised to avoid the graver cutting into the incision. You should merely cut to it, cutting out all the metal in front of the tool, but not cut into said cut.

At Figs. 5 and 6 are delineated the principle of lapping the cuts of octagon shaped letters. The letters D, O and H, will exemplify the positions of such cuts at Fig. 2, in forming letter B.

The incisions being of equal depth and accurately cut, it will be difficult to detect where one leaves off and where the other begins. Cutting the curved portion of B at Fig. 13 is done, when the letter is to be bright cut, by making several of the octagon cuts above mentioned, each cut being so fine that the general appearance would be that it was one clean cut. It is often the case, owing to the size of the letters, that it is necessary to turn the flat graver up on the left corner and make one clean stroke of the curves. Of course, the cut made in this way would have an angular appearance, i. e., one side of the cut is deep, the other is at the surface of the metal. Here we are called upon to effect the optical illusion heretofore described by now adding the fine hair line around the curves so cut, to give the sunken appearance to that side of the cut that is even with the metal's surface.

CHAPTER XVIII.

Block letters engraved in the various ways mentioned are easily ornamented, but we should thoroughly acquaint ourselves with every detail and master engraving them plain, before we attempt to indulge in the more advanced ideas. Some men doing engraving (we will not give them the appellation of engravers), try to cover up the errors of their poor work by adding some fancy flourishes. I hope none of my readers will make a practice of such an unwise and unfair method; it may be true that an expert engraver could add an extra ornament to some fancy work that would entirely obliterate a superfluous cut made, owing to the point of the graver breaking off, but that does not indicate the advisability of one laboring with plain lettering to endeavor to cover up his poor work by *trying* to add some extra flourishes or embellishments.

Assuming that the reader has qualified in the plain block or Roman lettering we will devote some space to embellishing same, trusting that such ornamentations will be used only on proper occasions.

We will first apply our embellishment to block letters engraved in the bowl of a tea spoon, where the same has a satin finish and has been gold plated. For some time there has been, and is at present, a demand for lettering in the bowl of tea spoons, such as the name of some city, club or society, where a block letter cut bright with a slight ornamentation would be the most desirable in most cases. First, such lettering would be easy to execute. Second, the fact of the broad contrast

between the heavy bright cut (which would be silver) and the gold back ground would present a very beautiful effect.

Block letters can be modified and changed from their regular forms, and the student must learn to make such departures and yet maintain the harmony of formation. Such edification can only be attained by an observing and studious pupil. Notice signs of such odd letters and never fail to scrutinize such lettering by good engravers. You may say that would be picking up the trade; it would not be picking up the trade exactly, but it would be picking up some good ideas which are original no doubt with the various artists. There are some good fancy letter designs in text books which could be used, but the best fancy, or we may say odd letters resembling the block letters, I think it is safe to say are original formations of the artist who will make his designs to suit the article and space to be inscribed. Such being the case, it would appear necessary that we cultivate taste and endeavor to acquire the skill for such work, which is not as difficult as one may think. In Chapter X we gave some hints for using the flat bottom graver for wriggling; in the work we now are considering we find such class of work useful. If we have a name to engrave in the bowl of a spoon, such as mentioned in this chapter, we first design the name in the bowl very accurately; you may make the first letter the same size as the residue, or a very little larger, as to you would appear the most appropriate; either would be correct in block letters. The name should read from the point of bowl toward handle or diagonal, and can be designed straight, curved, scroll shape or vacillatingly; in fact, in any symmetrical or odd shape. Only be sure to follow

the rules and usages consistent in such departures from the laws of artistic exemplifications. Having made a design suitable for the shape and size of bowl, we first wriggle the letters with the flat bottom graver; same to be very fine. Now we take a graver (it is of course understood that we are using bent gravers described for this class of work), wider than the one we used for

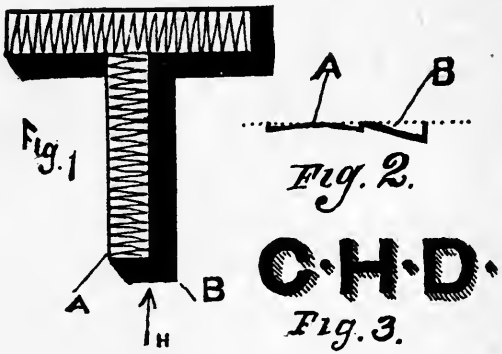


Plate 26.

wriggling (we can wriggle in the bowl of a spoon with a straight graver), and cut a bright cut shade on the lower right side; shading of block letters are usually *á droite.* The shade should not be cut flat, but on an angle, allowing the surface line of the incision to run along and up to the wriggle. This mode will perhaps be better understood by noticing Figs. 1 and 2, Plate 26, where A represents the wriggle and B the bright cut. At Fig. 2 is shown a profile or sectional view looking in the direction of the Arrow H, Fig. 1. Dotted lines at Fig. 2 represent the surface.

It is not necessary that the bevel of the cutting in the shade B should be at much of an angle. A slight

change in the reflecting surfaces of the letters is all that is required. It is astonishing to one who never gave the subject critical examination, how slight an inclination of surface is necessary to effect a contrast and give the letter an appearance of relief. The student can from the theory here exemplified easily apply same to any letter in the alphabet. From the position of the bright cut shade here shown it will be understood that the light supposing to cause the shade emerges from the upper left corner. The position of the shade can be changed to suit the fancy of the artist, but the one we have used in our illustration is one used mostly. Block letters cut with a half round graver gives a very neat effect and they are very easily executed. Letters cut with the flat bottom tool as described in a former chapter can be used in this connection very effectively.

Wriggling for letters to be cut as shown in our illustration can be done with flat bottom, half round and lining gravers; and the wriggling can be made in several degrees of fineness, thereby enabling us to make eight or ten letters after the style above mentioned, all giving a different appearance.

Script and roman letters can be used for engraving spoon bowls with beautiful effect, the former especially. The styles of wriggling here mentioned are used for engraving Roman letters as well as block or gothic. In the chapters in which we briefly considered Roman letters, I did not mention the lower case of that style. My reason for so doing was that such style of lettering is seldom used by bright cut engravers, and the concise instructions given for the capitals will I believe afford sufficient instructions

for one to apply to the lower case should they desire to use same. The theory is the same, and as the text-books have the letters of the lower case they would be easily accomplished should one care to engrave them.

Another style of cutting block or gothic letters suitable for the class of work now under consideration is to wriggle the letter first or cut it out with a lining graver, then cut a bright cut each side of the various bars forming the letters. This manner of cutting the letters will give them a relief appearance, and if neatly done will appear beautiful. The class of work above mentioned is very useful for coffin-plate work or any similar work where attractive and cheap designs are required.

Block or gothic letters engraved bright cut in the bowl of a spoon and then lined as shown at Fig. 3 with a lining graver, cutting four to six lines at each stroke, produces a very effective appearance, and is desirable to execute when cheap showy work is wanted.

We have now given adequate space to the Roman, block or gothic letters, where same is cut with the flat bottom tool not shaded (only in a cheap way here mentioned). In our next chapter we will consider this style of lettering shaded, *i. e.*, outlined with a filling between such outlines and shade.

CHAPTER XIX.

In engraving shaded letters we find the flat bottom graver the best tool for cutting the shade strokes and some engravers use it for cutting the entire delineations. It does not, however, appear to be the best tool for cutting hair lines, but is indispensable for accurate shading of block, Gothic or Roman letters, and we may state that the reason for it being the most practical is

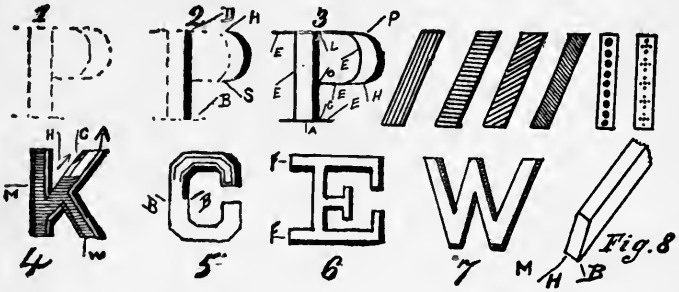


Plate 27.

that when beginning a shade stroke or ending one when same should be square on the guide line or parallel with some portion of a letter, the maximum width of the shade stroke can be carried up to such line. For illustration, please note Fig. 2, Plate 27. Here we find it required of us to begin the shade stroke square on the line at D and end it likewise at B. Owing to the fact that the flat bottom tool is square on the front or, in other words, the cutting edge is sharpened on right angles with the graver blade, the work as required can be easily executed. We show end view of such a graver blade at Fig. 8, which will thoroughly demonstrate the feasi-

bility of its use in this connection. If we were to use the square graver in its stead we would experience the same difficulty as in cutting the letter *i* or *t* in script, and the reasons for such difficulties we explained under the head of script work. I make mention of the use of the square graver being used for shading letters of style now under consideration as I know some engravers not cognizant of the superior merits of the flat bottom graver use the square. We will admit that the square tool can be used for this style of shading, but not with as perfect results.

Another point favorable for the use of the square graver is that we can by the use of both corners of its cutting edge shade to the right or left equally convenient. At Fig. 1 the delineations represent the sketching required for a guide when engraving shaded Roman letters. The beginner should be cautious not to do too much sketching. Having sketched the letter as shown at Fig. 1 we next take a flat bottom graver, a little wider than the width of shade we desire to make, turning the tool up on the left corner B, Fig. 8, and placing same on the top guide line at D, Fig. 2, inserting the tool at place of beginning so the cutting edge (front of graver) will cut a chip about the width from H to B, Fig. 8, which is sufficient for the stroke required to shade the letter P, and push same forward to lower guide line at B. The pupil will readily notice that the flat face of the graver will cut the chip out flat on the line at B. The point or corner B, Fig. 8, of the graver should traverse the sketch line, thereby making the entire shade inside of the sketch lines. If this rule is followed we will engrave our letters same width as sketched, including the shade, consequently, when we have finished our sketch, we can see just how our letters will appear when

completed. To complete the letter P we next place the right point or corner of graver M, Fig. 8, at S, Fig. 2, and cut up to H. The angle of the stroke, of course, to be on the letter. In *all* shading of shaded letters the shade stroke should be made with angle of said stroke on the letter. We explained this important matter in a previous chapter by illustration.

We have now cut the necessary shade strokes and can now exchange the flat tool for the square and finish the letter by cutting the hair lines, or, as before stated, we can use the flat tool. The former being preferable we will pick it up and placing point at A Fig. 3 cut the hair line to the right, beginning again at A and cut to the left. The ends of such lines should be blunt—ending *same* width of the line—in order to effect that appearance we find it necessary to resort to the above method. We *could* begin at one end and end at the other, which would be the quicker way, but what would be the effect? Simply that one end would be blunt and the other pointed. Some of my readers may say that it would be good enough if cut with one stroke. Should one anatomize the work under a glass with the scrutiny becoming a student in art, no matter how scrupulous he may be, I am sure the work executed by cutting both ways would appeal to his good judgment sufficiently to warrant his adhering to that mode of procedure, even though it would require a few extra cuts to execute.

I make mention of the disapproved method and caution students regarding it, as I have noticed many engravers following it, greatly to their disadvantage. It is the little things brought into action that produces the desired effect, and it is our duty in modern engraving to strictly follow those lines.

Continuing the letter P, we begin at bottom of the perpendicular line E and cut up to the top. Next beginning at O cut the hair line out to H, beginning at E on same line, the line is continued up to where it meets the line forming the top of the letter. Now, place the graver point at P where the shade stroke ended and continue the hair line to the end E. Now, we cut the fine hair line at the left of the shade stroke, where said stroke and surface of metal meet. This completes the letter in formation, and now we have to consider the filling. By filling we mean the embellishment to be engraved between the hair lines and shade strokes. Before we take up the filling would say that the letter P could be engraved with sequel, as above, by first outlining the letter with hair lines and then adding the shading. The objection I have to this method is that we go over the same ground twice when we engrave the shade, and should we fail to exactly follow the line previously engraved we would have two lines where one is wanted. The latter is not as much of an objection as the former.

At the right of Fig. 3 we illustrate six styles of filling, probably the most commonly used, the first four being of the same line of work, only changing the direction of the lines. Any of the line fillings can be executed with a lining graver on all cheap work, but is usually done with a square graver on fine work, such as a fine block monogram. The two styles at the extreme right are made with a round bottom graver, by making little "digs," being very careful to throw the graver out so as to break the chip off.

The Gothic letter K at Fig. 4 is engraved in outline same as Roman. We here show the horizontal line filling slightly elaborated. The extra hair line A is made

after the hair line along the shade stroke is completed and should be just inside each shade stroke and each outline, so when the letter is complete a line of the metal's surface will be conspicuous at the inner side of the shading and outlines. At the left of the letter K, indicated by line M, is shown a very effective embellishment. The cuts are made with a flat bottom graver and the maximum width of each cut just fills the space between the lines, as illustrated at C, the same being cut in the direction of the arrow. This work is executed only on the left of the letters or opposite the shade stroke, leaving the surface line inside the shading plain. The letter is complete without this ornate addition, but the letter can be beautified by adding it. Should we desire to elaborate the letter still more either of the two styles shown at the extreme right of the letter P can be added.

At Fig. 5 is shown the principle of shading and lining, above referred to. The delineations below BB represent the sketching. At the letter B, *á droite*, we show the shade stroke where the graver has been thrown out to clearly demonstrate the theory of such shading, and it is manifest that the shading is all done inside the sketch delineations. We also stop the hair line at the left at B to show that the letter at the top is complete for filling while the lower portion is as yet unacquainted with the graver. It is, of course, to be understood that the shading is first completed, then the hair lines, and so on, as explained above, for engraving the letter P. We show them cut off here to thoroughly explain, as above mentioned.

At Fig. 6 is shown a style of block letter with the horizontal bars made a very little heavier than the perpendicular. The principles for engraving these letters

are the same as for others described. This style of lettering is made very effective in the solid style of letter (not shaded) by wriggling the perpendicular bars heavy, and the horizontal bars very fine, with a graver a little wider.

At Fig. 7 we illustrate the letter W with a fine wriggle for a shading. This class of work is very useful for coffin-plates or similar grade work, it being very showy, quick and easily executed. As illustrated, the letter is ready for any style filling the artist may deem expedient to ornate it with.

Space will not permit our deliberating further under this head, but as we proceed we will consider work that can be used in this connection.

I am sanguine that my readers will be able to engrave the alphabet in any of the styles we mention as we proceed from the points or hints we endeavor to make plain. It would be impractical to give each style the necessary space to take each letter of the alphabet, neither do I deem it necessary. We endeavor to select such letters as have the various bars, etc., or equivalents of the residue of the different alphabets, and if the reader will carefully study the instructions for such letters he will have no trouble to engrave the others, depending on your text book for formation of letters.

CHAPTER XX.

Old English letters are used more than any other, by the engraver, except script. This style of lettering is plain enough to be readable and at the same time is very ornamental. Old or modern English letters are engraved in many different styles, and while space will not permit our considering all, we will endeavor to take up the methods and styles used mostly.

The most common and easiest way for the beginner to cut English letters is to wriggle them, but as I believe good wriggling to be more difficult than bright cutting, we will first direct the reader's attention to the latter.

Solid English letters (not shaded) are cut with a flat bottom graver. If we are to engrave on a plate or a tray, the graver should be ground off on the under side, to raise the hand sufficiently to manipulate the tool gracefully. The gravers of the size that would be used for engraving on watch caps are not ground off as above mentioned, it being only necessary to whet the under side so it will be perfectly flat. The graver should always be sharpened by whetting the end. The whetting on the underside is done only to make it dead flat.

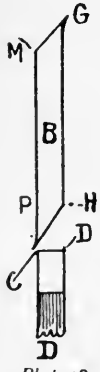


Plate 28.

At B, Plate 28, is shown one of the main bars of old English letters. The end of the graver D, which is the width of the bar we desire to cut, is shown in position to engrave the bar B. It is to be understood that these bars should be engraved, leaving each end pointed about as shown at P and G, Plate 28, and the less cutting we do to obtain the

desired form just so much better will our work appear. I am cognizant of the fact that some engravers begin this bar by cutting the width of the graver and then make a pointed cut both at the top and bottom to gain the correct form. This gives the work a "chopped up" appearance and necessitates unnecessary work. On very fine work, such as would be engraved on a watch cap, it may be well to follow this method but for bright cut work, or any work of size larger than that mentioned, it is not satisfactory.

To cut the bar complete with one stroke, we place the point C of the graver, Plate 28, at the point P, of the bar and turn the graver over to the left, so that only the point C will come in contact with the metal; now, as the tool is pushed forward it is gradually turned to the right, so that the graver will gradually cut a deeper and wider line until it is pushed up as far as H, where the full cutting edge or front of the graver is inserted. The graver should now be held firmly and parallel with the article in hand so the bottom of the incision will be cut perfectly flat, and so continued up to M, at which point the graver is rolled over to the right gradually on the point D, and so continued until point G is reached, where the tool is thrown out or runs out. The graduation of this turn of the graver should be exactly the same as the one at the bottom or beginning of the stroke. To engrave the little cut at W, Plate 29, the graver is placed with the cutting edge at the extreme left, in the incision at A, so to insure the cut being made of the same depth as the one from which it protrudes.

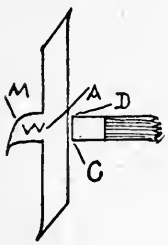


Plate 29.

The graver is now pushed forward in this position until arriving at M, where it is turned or rolled over to the left on the point C.

Now if we turn our graver around to the right, as it is pushed forward, as shown at Plate 30, which represents the graver in the position of being rolled over to the left and turned to the right, gradually turning or rolling it over on the point C, it can be easily run out at a point, thus ending the stroke as desired.

At Plate 31, we have delineated a stroke used in old English; it is engraved in the style now under consideration by placing the point of the flat bottom graver C at M with the graver turned well over to the left. Now as the tool is pushed forward it is gradually turned over to the right, as the complete graver is also turned around to the right; the latter turn will effect the curve while the former widens the stroke.

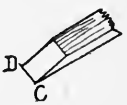


Plate 30.

That you may conceive the idea I wish to convey, please note the difference between turning the graver *over* to the right or left and turning the graver to the right or left. By turning the graver *over* either way, we mean to turn it so as to make it cut the line wider or finer, while pushing it forward in the same direction and by turning the graver (leaving out the word over) we mean to swing the graver handle around so as to make a curve.

Plate 31.

The graver is pushed forward as above mentioned, until it is turned over so as to cut the stroke the entire width of the graver's cutting edge. The tool should be in this position as it reaches the line W H, (the end of the stroke).

I believe there is no stroke in solid, bright cut, old English engraving that is so badly treated by some engravers as the one at Plate 32, and at the same time it is as easy as any to execute if handled correctly. As stated above, bright cut work should be cut as clean and smooth as possible, this being true it would be our duty to execute the stroke by making one cut only. To do this we place the point of graver D, Plate 32, at M, the point of beginning, with the graver turned well over to the right, so as to, in the beginning, cut only a hair line. It is then pushed forward, turning the graver to the left to make the necessary curve, and at the same time turning it over to the left gradually, to widen the stroke and so continued until the graver is turned so the cutting edge is flat on the metal and cuts the stroke the entire width of its cutting edge. It should be in this position in the center of the stroke at the line D. The turning of the graver over to the left is continued and as we pass the center D, the point of the graver D is gradually turned up, leaving the point C in the metal while the point D is raised up from the metal. We now turn the graver to the right to make the curve and as the tool is pushed forward it is gradually turned over to the left and so continued until arriving at H, at which point, if the directions have been followed, it will be cutting a hair line.

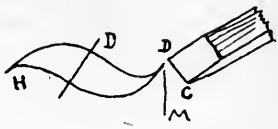


Plate 32.

The reader will note that we commenced with the point D of the graver and by rolling the tool as directed we end with the opposite point, C. The hair line at each point can be made as long as the engraver desires.

When cutting this stroke with a very wide graver it is a good plan to cut a hair line along the edge of the cut where it meets the metal's surface. The principle of cutting this line and reasons therefore have been explained in a former chapter.

At Plate 33 we show another stroke, which is cut by placing the point C of the graver at M and quickly turning it over to the right, so that the graver will cut its entire width up to G where it is turned back to the left as the graver proper is turned to the right, to execute the curve, and so continued until it meets the line with which it is to be connected, at which point this bar should end, pointed as shown in our illustration.

Plate 33.

The curved bar at Plate 34 is a portion of English letters located at the bottom of several letters of this style. When cutting this bar the work is turned so as to read top down, or in other words wrong side up, and for this reason our guide letters are so turned and as the reader is studying this Plate he should reverse the illustration.

Plate 34.

We show the cut as it appears when connected with letters and as the method of cutting is such as to necessitate reversing the plate so the top of the letter will be nearest the engraver we make our illustration as the actual graver would appear to the operator. Point B, of the graver, Plate 34, is placed at the point of the cut and turned well over to the right, so as to cut only a hair line at the beginning. As the tool is pushed forward it is gradually turned over to the left, to widen the

cut, and at the same time turned around to the left to execute the necessary curve. When the graver reaches the end of this cut it should be turned down, so that both points of the tool are inserted, and the cut ended with same width as the graver. A fine hair line is now cut along the top line to give that portion a sunken effect.

At Plate 35 is shown a bar used in several old English letters and one considered by some to be difficult of execution, but which is easily done by carrying out the following method. Insert the entire cutting edge of the graver at M and push the tool forward perfectly straight until the line W is reached, at which point the graver is turned a very little to the right and then pushed forward a very little, then again turned to the right and again pushed forward as before, and so continued (making in all four or five such turns) until the turn is completed.

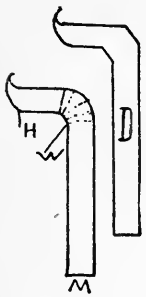


Plate 35.

The graver is then pushed forward, cutting its full width, until it reaches H, at which point the left point of the graver is gradually raised, thus cutting the stroke finer until it becomes a hair line point. As the graver is thus turned out it is also turned around to the left to make the desired curve at the end. The bar at D, Plate 35, is cut the same as this excepting the octagon turn at the top; former instructions will suffice for its execution.

I am sanguine that those of my readers who have followed my endeavors to instruct thus far will with the elucidations in this chapter, experience no trouble in engraving any capital letter in old English, cut in the

style herein mentioned. Remember that practice is requisite and do not expect to cut any of these strokes, cuts or bars, as they should be until after you have passed through the ordeals of practice.

CHAPTER XXI.

Lower case Old English letters are comparatively easy to engrave. The most difficult feature we have to contend with is the angle of the angle strokes. The perpendicular bars usually trouble the beginner some, as he has been engraving script letters on an angle of forty-five degrees, and in consequence of the latter he is apt to permit the perpendicular bars of the Old English to lean a little to the right; but if the student will keep the work in hand directly in front of him, with the top and bottom guide lines horizontal, he will experience little trouble. I find that in most cases where students have been engraving script, they hold or lay the article to be designed upon to the right of the body and the the horizontal guide lines on an angle with the body, in position about as one would write. There is no objection to this position when designing script (in fact it is the usual position of an engraver when sketching letters on an angle) if he will remember to change to one above mentioned when designing Old English. This a pupil not under an instructor is apt to overlook and will hold the article in front of him when designing Old English as above mentioned for designing script, and consequently will usually find his letters leaning to the right. Another very important point is in lapping the perpendicular and angle strokes. We gave a few hints relative to this work when considering block letters which should be strictly followed here, except the graver is always thrown out at the end of each perpendicular bar. For illustration see Fig. 1 (the word come). To engrave this word, we first cut all the per-

pendicular bars up, as shown at Fig. 2. We next cut the angle strokes at the top in direction of the arrow, Fig. 3. All angle strokes should be engraved in the same direction, i. e., begin on the perpendicular bar and cut out. To engrave the angle strokes at the top of the word come, Fig. 2, indicated by the dotted lines, we first cut the one at the top of the letter C, then the letter O, and so on through the word, remembering to use the first stroke cut at the top of the letter C as a

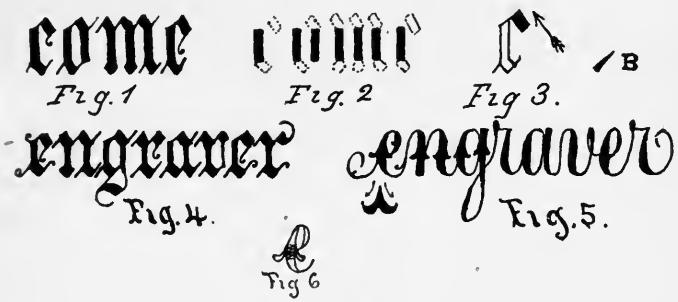


Plate 36.

guide, and cut all others exactly on the same angle and the same length. The top of the letter C in Old English is not always engraved the same; should the engraver select another style, he should then use the angle stroke of the letter O for a guide, as mentioned above. It matters not what the word may be, the first perpendicular or angle bar or stroke should be a guide for the residue. We now reverse the work and cut the angle strokes at the bottom same as above, except, instead of beginning with the first letter, we commence with the last letter in the word; reason for so doing is obvious. The bottom finish of the first two bars of the letter M

is a cut made by inserting the graver as for cutting an angle stroke and push it forward the width of the cutting edge of the graver, thus forming a perfect square. Several other Old English letters are treated likewise, as the text-books will show. Having cut the angles at the bottom, we next begin with the first letter and cut the lines connecting the bars of each letter and protruding from same as shown at Fig. 1. Most beginners engrave these lines by beginning on the letter with a fine line, and as the line proceeds it is cut deeper and wider and when finished would appear as shown at B Fig. 3.

I wish to caution the student particularly regarding this common error. Begin all these lines on the letter and cut out from same—never cut a line into a letter.

Lower case Old English letters can be engraved with the flat bottom graver in various styles. The word "come" shown at Fig. 1 is to represent the effect of bright cut, the black bars as here shown, are cut, with one stroke of the graver, which is perfectly finished to cut a bright cut. The hair lines are cut with a square graver, polished. Now should we desire to ornate this class of work, we wriggle the perpendicular bars very fine, leaving the angles bright cut. Leaving the letters bright cut is one style of finish; wriggling the perpendicular bars only is the second finish. To make the third we wriggle the angle strokes, leaving the perpendicular bars bright. The fourth finish is made by wriggling the complete letter. The fifth by wriggling the perpendicular bars very fine and the angle strokes much coarser. The sixth is the reverse of the fifth. The reader will comprehend that with the one flat bottom tool we can engrave six different finishes, thus giving us a

broad scope of variation in style or finish, all of which are easily executed when we know how. Another style of cutting very useful for cheap showy work is to wriggle the letter first, then cut a bright cut shade on the right of each bar, same as previously mentioned for cutting block letters by wriggling and shading.

Should we desire we can elaborate the work still more by cutting a bright cut shade on each side of all the bars of each letter which has first been wriggled. All this work can be done with the one graver. I have seen Old English letters that were engraved with a half round graver, but can not say that I consider it advisable for the beginner to spend any time with that tool in this connection. The flat tool can be used easier and with better effect. Especially is this true with the lower case letters.

The various ways mentioned for using the flat tool for bright cut work is applicable for work on polished metals, except the graver is *not* polished, consequently the cuts will have the appearance of having been cut with a very fine liner, instead of being a bright cut. The gravers for polished metals should be left as they come from the oilstone.

I think it is safe to say that seventy-five per cent of lower case Old English letters engraved by our best letter engravers at the present time are engraved by cuting the angles a very little wider than the perpendicular bars. For illustration see Fig. 4. The engraver must exercise his judgment as to the shape of the letters; they can be designed and engraved oblong or grotesque shape as best suits the space and shape of article to be engraved. This is also true with all letters, except perhaps with script, which style should not vary but little.

Should we be called upon to engrave script letters in a space where it would be necessary to make the letters more oblong than usual, we then engrave the letters perpendicular, which style is very neat if well executed, and the letters can be so placed as to engrave a long name in a small space. At Fig. 5 we show such script letters. The first three letters are embellished to show the student the appearance of a slight embellishment. Directly under the letter E we have the cuts used in this style of ornamentation; the arrows show the way each little cut is made. Before adding these cuts we select a half round graver about size of the shade of each letter and wriggle the shade about as much as shown at Fig. 6. The wriggling can be added to the plain letters without the little cuts, or vice versa; or we can use both, should we care to increase the embellishment.

When cutting script letters, as shown at Fig. 5, it is sometimes necessary to square up such letters as are usually squared by an extra cut, by beginning the cut on the opposite side of the letter from the one used in regular script. This class of lettering is extensively used for engraving names of cities in bowls of tea spoons. The letters are cut very heavy and with a perfect bright cut and are very showy and neat.

This style of script can be engraved on a curve or scroll shape, while regular script can not as effectively, in fact it is, as a general practice, unwise to engrave script letters on an oval curve, but when done the curve should be very slight.

CHAPTER XXII.

Old English capitals are very commonly engraved by wriggling and can be executed in that way with good effect if well done. It is very easy to wriggle the straight bars of all letters but it is quite another matter when we attempt to cut the curves. When beginning a perpen-

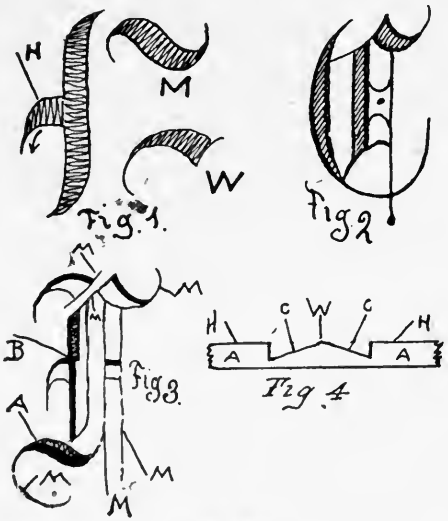


Plate 37.

dicular bar we can, by holding the cutting edge of the flat tool on a slight angle begin the bar quite pointed, in so doing soon as we have rolled the graver two or three times to effect the wriggle we turn the tool so the cutting edge is horizontal with the bar and so continue until we near the end, where, if desirous of making same

pointed, we proceed as in the beginning by turning graver lightly, at same time gently forcing it to the right.

The stem or short bar, H, Plate 37, Fig. 1, is wriggled by (when arriving at line H) gently pulling graver in direction of the arrow at same time the graver is rolled right and left to make the wriggle, but it will be seen that by pulling the tool off in the direction of the arrow (not turning the graver) we will make the bar pointed. At first, when practicing this, the student will experience a great danger of graver slipping, but that can be mastered by a little practice. The scroll M, when engraved small, is executed as mentioned above for perpendicular bar. Both are sometimes pointed by an extra cut, but it is better to wriggle them pointed. Should we want to engrave the scroll on a large scale (wriggled) we begin in the center and wriggle each way; the reason for doing this is that we can then wriggle the scroll out to a point as described for wriggling bar, H, i. e., by pulling the graver off in the direction of point of scroll, and at the same time wriggling and hold tool in position as you would if you were wriggling a straight bar. The curve W is engraved same as one half of the scroll above described.

It is requisite in fine wriggling for the graver to be in perfect order, cutting edge sharp and the under side dead flat.

Old English letters are very commonly wriggled on plated spoons and forks. It is much easier to wriggle the letters than to cut them out with the flat tool, owing to the fact of the metal being so hard. Should we care to beautify the work, it is an easy to matter to cut a shade stroke along the edge of the wriggling. Another style of engraving Old English on hard metal easily is to outline the letter and wriggle the lower right side of

each letter, such wriggling answering for a shade. For illustration see Fig. 2. The outlines are first engraved, then with a half round graver of suitable size we follow the incision made with the square graver on the lower right side of each bar and wriggle very fine. If the letter is very large we wriggle the shade first with a flat bottom tool, then engrave the outlines, after which the filling is engraved.

The filling in between the delineations of each bar of the letter can be executed in various styles. The one here shown consisting of cross lines is made with the square graver, but can be done very quickly and much finer with a lining graver, cutting several lines at each stroke. Another style of engraving Old English letters for cheap work and one used to some extent by engravers for large stores, where they find it necessary to execute effective work and at same time neat and quickly, is to first sketch the outlines of the letter, then with a square graver cut the line at the left and upper side of each bar, by making quite a heavy cut, but not a shade stroke. We show at Fig. 3 the letter F sketched and partially engraved for illustration. The fine lines are to represent the sketching and the heavy lines those cut with a square graver as above mentioned. Now we select a half round graver of such size as would wriggle a cut half the width of the perpendicular bar of the letter and then wriggle all the lines cut with the square graver. At B is shown the wriggled cut; that portion of the bar below the line B and indicated by the heavy line is the line the half round graver is to follow. The wriggled cut is shown here to stop at line B, leaving the remainder of the bar uncut, that the reader can better form an idea of the work. Having gone all over the

heavy hair lines with the half round graver, we now take the flat bottom graver and cut a bright cut along the right and lower right side and directly up to the wriggled line, after which the hair lines M are cut These lines can be engraved with the flat bottom tool, but I prefer to lay it down and pick up a square one, believing it to be the best tool for cutting hair lines, at the same time admitting it can be done dexterously with the former. At A the heavy black line is to represent the bright cut, the upper side the wriggling, and as that portion of the letter appears, it is complete. The reader will, therefore, comprehend I believe, the ideas we have endeavored to convey and note that the letter consists of a very fine wriggle (as wriggling with half round graver can be made very fine and is so intended as here mentioned) and bright cut shades, and such a combination will present a very neat, showy appearance. The reader will note we have made mention of similar work, using flat bottom graver for wriggling, but when you have followed both methods or styles you will learn that there is a difference in appearance and the latter style can be applied to much finer work than the former and is easier to execute; also that the method employed in the execution of the latter would necessarily make the letter cut deeper, and is therefore desirable when an article to be engraved is subjected to much wear.

At Fig. 4 we show a sectional view of a style of cutting Old English Block or Roman that is gaining popularity with some of our best engravers in view of its presenting a beautiful effect and is so difficult to engrave *well* that the less skilled artist would not exhaust his efforts to attempt it, therefore the work would appear to have an individuality (of a good engraver) or would

be characteristic of proficiency in the art. While the style referred to is difficult to engrave well, yet one that can wield the graver with dextrous precision would find that it is easy to execute and can be done quickly.

This style is not dissimilar to the one previously described, the dissimilarity being only an exchange of a wriggle for a bright cut. The illustration will fully demonstrate the method employed in executing the double shade letter. A A represents the metal on which the letters are to be engraved and H H the surface of the metal.

The letters cut in this way consist of two shade strokes one shading to the left and the other to the right. C C, Fig. 4, represents the shade strokes. The reader will note that the two shade strokes meet at point W and a letter cut in this way will appear to be in relief. A flat bottom graver is the only tool required and with that tool we can engrave letters of a great many widths. The shade to the right is cut with one corner of the graver and the one to the left with the other. Letters of this style are very desirable for satin finish silver and plated ware, the cuts being bright and the back ground satin finish, thus presenting a decided contrast.

Old English letters cut with parallel lines, as has been mentioned for block and Roman, are very effective when engraved on polished gold or silver with a graver as it comes from the oil stone. There are many other styles of cutting "English" letters except what is known as "shaded Old English," but space will not permit further consideration of that class and I believe from those mentioned the beginner will be able to form styles enough in that particular line; he should, however,

remember if that is all he knows that he does not "know it all," and should at all times be on the alert for new styles and willing to add to his stock of styles, at the same time bearing well in mind that it is not the number of styles of letters that one is able to engrave that makes an engraver of him, but it is how well he can do those that he is familiar with. It is better to master the "king of all letters, script" than to engrave many styles and not do any of them well.

In this work we do not expect to give instructions in all the styles of lettering, but those we think would be most useful, and from the training the beginner will receive in learning the styles we here will consider, we believe he will be able to engrave any style he may in the future see that he considers good.

CHAPTER XXIII.

Shaded Old English is a style of letter that we are often called upon to engrave, and I think it is safe to say is generally preferred by customers. The student having followed these lines of instructions from the beginning, will now be able to engrave this style of letter easily, as it is a conceded fact that Old English is easily executed, and at the same time we are looking upon these letters in this light, I am desirous of presenting a few cautionary arguments relative to students in the art, following the theories that some of our engravers, who only occasionally do engraving (I refer to watchmakers in small cities) have of necessity or otherwise found their alternative. And that is to engrave Old English, as they can make the letters far from true, and it would not be noticed by the average customer, "because the letters are so mixed up they would not notice mistakes and the poor work." This could not be done with script or block, therefore we often see specimens of the class of engraving above mentioned that would cause one to feel that there was no such thing as art in engraving.

Old English lettering requires skill to execute it to the full exemplification of the style, and yet we say it is easy to engrave, and truthfully, as one being able to engrave the styles of letters that we have considered in these pages, would at this time possess sufficient skill to master Old English easily. While it is true that Old English letters are not difficult to engrave, it is equally true that they are not easy to design until we have made a thorough study of their correct formation. This

style of lettering being in demand on fine and expensive articles, should be designed with the utmost care, following every detail, and the cutting should be executed very accurately, every cut clean and bright (when cutting bright cut) being very cautious to avoid "wave cuts," or irregularities of any description. Do not slight any portion of the letters; it matters not how small such portion may be, it should be executed adroitly, and with as much care as any of the principal bars. Not one portion of any letter of this style can be neglected and maintain the original appearance, and obtain the desired effect.

A watchmaker may build a fine watch—perfect as can be made—but should he fail to poise the balance, the watch could not perform the functions expected of it; neither will a fancy letter appear as finished if any part is neglected. Block, Roman and Gothic letters are neat, Old English and German Text are beautiful and artistic if properly engraved, and if designed poorly and executed likewise, they appear to one with an average critical eye to be a conglomeration of a beginner's practicing exercises. Study the correct formation of the letters from your sample or text book, until you are familiar enough with the various styles to design and engrave them accurately without reference to books. When we have an article to engrave in Old English or German Text (we mention these two styles as they are very similar) where the letters are to be made small we use the methods described in the previous chapter, but if space will permit we use the shaded style. By shaded style as here mentioned, I refer to the style where the letter is outlined and ornated by a "filling" between the delineations, not as shaded as described in the preceding

chapter. Shaded English or German letters are usually used when engraving only one letter on silver spoons or forks, or any article with equivalent space for engraving, when a monogram is not wanted, and engravers are often asked to engrave three initials on such articles as silver match boxes, napkin rings, etc., the same to be fancy, but not interwoven; in such cases we usually use Old English or German Text. Those styles, especially the former, are very elaborate and artistic and are easily read. When a jeweler asks a customer what style lettering he would prefer, I think it is safe to say that in nine cases out of ten they would request script or Old English. Therefore, the student should thoroughly study those styles, and master them in detail, and after he has accomplished that line of the art, he will find by making a study of fine specimens of those letters, especially in Old English, that many changes can be made, departing to some extent from the rules of correct formation, and yet maintaining the harmony and general form of the original letters, merely making such changes and elaborations as would better harmonize with the article and space to be engraved.

Such modifications are expected of an up-to-date engraver and in addition thereto he must, as I have before stated, be able to form letters of new and modern ideas, and such knowledge can only be obtained by a most thorough study of the letters commonly used (most of which we have mentioned in these chapters) and a very careful observation of any artistic lettering that he may have occasion to scrutinize. At Fig. 1, Plate 37, we show a sketch of an Old English G, shaded, bright cut; as the letter here appears it is ready for any filling we may desire to use. These letters are usually shaded

with a flat bottom graver, especially when the letters are engraved large on silver and plated ware. There are many other styles of shading which will be considered later on. The reason for using the flat bottom graver for this style of shading is that we can cut equally well with either corner of the cutting edge; advantages gained thereby have been explained to some extent as applied to other styles of letters. Some engravers would use the above mentioned graver to engrave the entire delineations of the letter G, shown

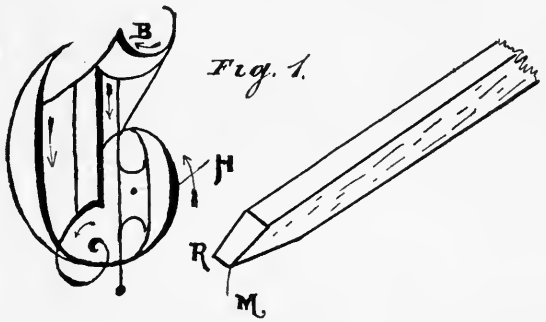


Fig. 1.

Plate 37.

in our illustration. I, however, do not believe it to be the best tool for engraving hair lines for reasons I believe to be obvious to any that have used both the flat bottom and square gravers.

There is, however, no doubt that the first mentioned tool is the best for shading. The square tool being the best for hair lines, I personally use and recommend to students both gravers in engraving a letter, such as shown by our sketch. First engrave the shade strokes in direction of the arrows with the flat tool, then finish the delineations (hair lines) with the square one. The

fine hair lines previously described in connection with Roman lettering are now engraved along the edge of the shading.

The shades H and B, Fig. 1, are engraved by using corner R of graver; all others are cut with corner M. The reason for using first one corner and then the other of the graver is that by so doing, as here directed for this letter, we keep the portion of the letter being engraved between our eye and the graver point, while, for illustration, should we cut the shade H down with corner M of graver instead of as we have mentioned, we would have the graver between the eye and limb or bar of letter being cut.

Students should bear in mind one fact in connection with shading, which is true applied to any style of double line or shaded lettering, and that is as I have stated before, to always shade on the letter; by that we mean that the angle of the shade stroke cut should be on the letter.

The ideas here presented for old English are also applicable to German text.

Early in these chapters I mentioned a marker or tracer for designing letters for engraving; one end of said tracer was steel. After the student has acquired sufficient skill in designing (which those who are following these chapters practically should at this time have acquired), it is often advantageous to very carefully and lightly scratch the design on the metal. It is apparent that the design thus scratched on the article to be engraved must be nearly perfect, and the cutting should cut the design out entirely. I would caution beginners not to use the steel point; wait until you are competent to make the design just as you want it. It is well in

making large designs to first design with the pencil or rubber point, touching up the design until you are satisfied with it, then with the steel point go over the original design, scratching it on the metal very lightly. Now you will be able to remove the wax or paint through which your design was first made, and now you have the clear surface of the metal to work on, and the scratches for a guide. I do not recommend this manner of designing for all purposes. It is the most desirable in some cases, such as some very fine work on a crest, coat of arms, or large monogram and any work of such size as would be apt to be expunged during the operation of engraving, if only designing wax was used. A good engraver seldom experiences any danger of erasing his design, but there are many reasons for scratching a design on the article to be engraved, and the danger mentioned would be a consideration.

The steel point is also very useful for designing inside very narrow rings.

The steel and rubber pointed marker mentioned above is now for sale by the jobbers.

CHAPTER XXIV.

Lower case Old English letters, consisting principally of perpendicular and angular bars, are much easier to engrave than the capitals. They must not, however, be slighted, as while the above is true regarding comparison in execution, it is equally true that if the lower case letters are not engraved accurately, they will show the

Fig. 1. *Fig. 2.*

Fig. 3.

Plate 38

inaccuracy perhaps more prominently than the capitals, owing to the fact of the former being made in general by perpendicular and angle strokes, while the latter has curved strokes and protruding bars, and other ornate lines, all of which has a tendency to so complicate the general view that any little error would not be noticed. The beginner must not take advantage of the possibility of thus endeavoring to deceive his custo-

mer, but make each part of the letter perfectly. Old English lettering can be engraved on an angle, curved, or in fact in many odd forms, so as to appear well. Old English capitals are engraved from one-third to one-half higher than the lower case letters, it depending upon the size and form of article to be engraved. I think it is safe to say that the capitals are in most cases one-third or a very little more higher than the lower case. I think that most engravers will agree with me when I say that lower case letters look better and more finished when engraved by making the angle strokes a very little

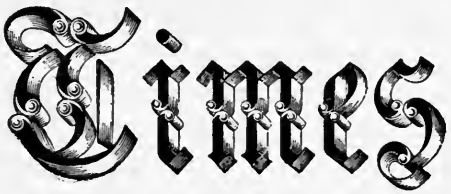


Plate 39.

wider than the perpendicular. For illustration and comparison please note Fig. 1 and 2, Plate 38.

At Fig. 3 the word Republic, in German Text letters, illustrates another style of shading the heavy bars as here shown black, are engraved by cutting bright cut or parallel lines, after which the hair line at the right is engraved. The little stem answering as a slight embellishment at the left of each perpendicular bar, is made by beginning on the edge of the bar with the right point of the flat bottom graver and turning quickly around to the left, throwing it out at a point.

In Plate 39 we show the word Times formed into a fancy letter containing marked elements or forms of both English and German Text. This style is only one

of the many that can be made from ideas embodied in the styles mentioned above. These letters are artistic, and while it may be true that they are "simple to engrave," yet it is quite true that each little cut has its effect on the general appearances, and should we fail to make each of the cuts as the form of the letter requires, we lose the effect. The black bars of each letter is cut with the flat bottom graver (when cutting bright cut); balance of the work is done with the square graver. The outer hair line is next engraved, then the fine shading lines are cut.

It is often required of engravers to oxidize a piece of silver, then engrave it bright cut, thus obtaining a dark background with bright letters, a very neat contrast. He is also often called upon to engrave a monogram, crest, coat-of-arms, or some emblem which should be oxidized. It is therefore quite necessary that an engraver know how to oxidize a piece of silver well, an accomplishment easily obtained by the use of the following formulas:

1. Place the article to be oxidized in a solution of liver of sulphur diluted with spirit of sal-ammoniac. Having left the article in the solution a sufficient time for the chemicals to act, it is taken out and thoroughly washed, dried and polished. This will produce a blue-black tint, while a solution of equal parts of sal-ammoniac and blue vitrol in vinegar produces a brown shade.

2. Sal-ammoniac, 2 parts; sulphate of copper, 2 parts; saltpeter, 1 part. These ingredients are reduced to a fine powder and dissolved in acetic acid. If the article is to be entirely oxidized, it may be dipped in the boiling mixture, which will act very quickly. If only parts are to be oxidized, both the mixture and articles to

be oxidized are to be warmed, and the former applied to the latter with camel-hair pencil.

Referring again to fancy Old English and German Text letters, the reader will please note Fig. 1, Plate 40. Here we have a German M, elaborated by a leaf-like ornament running along the edge, and fancy scroll work around and between the bars of the letter. The letter proper is engraved plain, then the leaf is added, and after that portion is complete the scroll work is engraved.

Fig. 1.

Fig. 2.

Plate 40.

The letter as here shown could be cut bright cut if on satin silver; if on polished metal, the bars of the letter would be engraved by cutting parallel lines with an unpolished graver.

At Fig. 2, the letter M, of "English" style, is elaborated by scroll work filled with parallel lines; the bars of the letter can be engraved bright cut or outlined and filled.

Fig. 1, Plate 41, illustrates a very elaborate "English" H, and as here shown is supposed to be bright cut. The scroll work is all executed with the square graver. The

heaviest portion of the embellishments are sketched very carefully, but the little curves and other small ornate cuts are executed without the aid of sketching. It may be well for the beginner to sketch all at first, to see how

Fig. 1. Fig 2.

Plate 41.

the letter will appear when finished, and to guide him until he has so educated his eye that sketching of those smaller portions of embellishment mentioned above will be unnecessary.

Fig. 2 illustrates a German Y with a flower leaf embellishment added to the bars of the letter. The scroll work around the letter is so designed as to make the letter with its general appearance effected by the oblong scroll work, suitable for a space of an oblong

form. The reader will please note the difference in form or shape of the letter M, Fig. 1, Plate 40, and Y, Fig. 2, Plate 41. One is designed to fit in a space the reverse of the other.

Plate 42.

The letter H, Fig. 1, is designed to conform to the space of an irregular space for engraving. For practical illustration, please note Cologne bottle at Plate 42. The letter H is a suitable design for a space of this

form. This space may require a monogram or name, but as we are under the head of "English" work we are to suppose Old English letter is wanted. The letter, as here illustrated, can be engraved bright cut, parallel lines or shaded. Should we not care to make the letter as elaborate as the one shown in our illustration, we can leave off some of the scroll work, or all of it, and then in order to fill the space at the upper left point of space to be engraved on bottle, we add the part of "English" letters B, Fig. 1, or what would be still better, fit a small scroll run down from top of the letter. The portion B would be placed a little above X to the right, should it be necessary to engrave the letter perfectly plain. Usually we are instructed to engrave a certain style of letter, or letters, and are not restricted with reference to embellishments further than that the letter should be plain (in appearance.) Therefore, if we have a case such as the Cologne bottle, where we find that we can run a fine single line scroll down or up from the letter, and gracefully fill up an irregular space, it surely would be "the correct thing to do." I, however, would caution the student regarding the so-called "fancy work" around, or in connection with letters. A little scroll cut at the proper time, in the right place, is conducive to artistic workmanship, while an over abundance of "fancy cuts" are characteristic of an engraver who is endeavoring to obliterate his work with cobweb ornaments, and while it may be true his work would be better appreciated if it were less noticeable, it still remains true that a student in the art of engraving should, when using ornamental work at all, do so conservatively and with great care, taking special notice that each scroll, or curve, is perfectly true.

CHAPTER XXV.

Inscription engraving requires, with all the elements of accuracy and precision, the execution of all the various styles of lettering we have mastered. Inscriptions of but few lines can be engraved in one style only, but if many lines are used we are able to execute a more effective or artistic inscription if several styles are used. Short inscriptions are usually engraved in script only, when using but one style.

Inscription work requires some study to correctly form the same. We may be able to engrave many styles of letters with precision, and yet lack the comprehension of efficiency in the formation of an inscription. This being true, it would behoove us to study with care the formation of letters in inscriptions. Each line should be so "marked off" (designed) and then cut as to harmonize with all other lines. The guide lines should be made perfectly true and very fine. A guide line made with a marker that has a blunt point is one of the mistakes of the beginner; the line should be fine as possible, thus enabling the engraver to cut the letters all on a true line.

A majority of the inscriptions engraved are executed on articles such as watch caps, medals and other pieces requiring the inscription to be engraved in a circle. We will, in view of this fact, consider this class of the work.

If inscribing a watch cap, we first remove the cap from the case and prepare it as described in chapter XV. After the designing wax is applied, we draw a line around the cap, using the edge of the cap for a guide. The style of compass to use is one with one steel point, and one point to which is attached a piece of

pencil lead or hard rubber. These compasses can be bought at the book stores as cheap as twenty-five cents each, but I would recommend one of higher grade.

We next draw perpendicular and horizontal lines, A A and B B, shown on Plate 43. Now we have the outer guide line, perpendicular guide line, center and horizontal guide line, the only requisites except guide lines for the letters, to warrant accuracy. The circle, perpen-

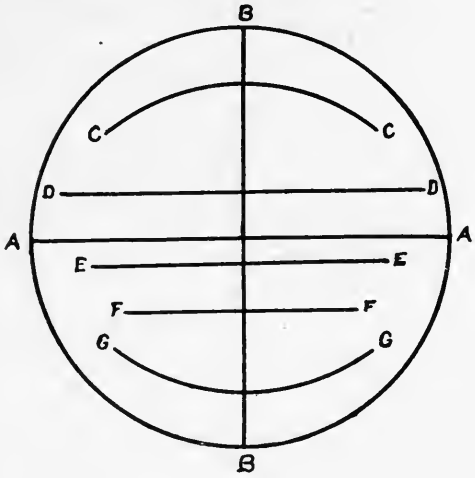


Plate 43.

dicular and horizontal lines form the nucleus only, around, in and about which can be engraved a perfectly formed inscription. Any attempt to design an inscription without the aid of such lines would be extremely unwise, especially for the beginner. An expert engraver would not use these lines to inscribe a cap with one, two or possibly three lines, if he was to engrave them in scroll shape or on lines parallel with each other. It would in such a case only be *necessary* to draw one per-

pendicular line for a center guide. We are not, however, to study the possibilities of professionals, but to consider the best forms and rules to be followed by the beginner, and that will result in the most accurate work, then when you reach that professional realm, you would no doubt look back and say that it was due to starting out with rules that assured accuracy, and by rote you accomplished requisite skill to design an inscription of a few lines without the aid of the rules herein mentioned. To design the following inscription on a watch cap we could form it as described: Presented to Charles P. Tickell, by his parents, on his twenty-first birthday, Sept. 12, 1895. Presented to on C C line (Plate 43) in small gothic letters, cut with a flat bottom graver unpolished; Charles P. Tickell, on D D line in old English; by his parents, on E E line in script or Roman letters; on his twenty-first birthday, in script on F F line; Sept. 12, 1895, on G G line in same style as C C line (gothic). By using the styles mentioned in the above, the reader will notice we are not required to engrave many different styles, only those used mostly. Now that we have decided upon how to form the inscription (what words to put on the various lines and their respective styles), we will now consider designing same. I believe some engravers design the entire inscription before they do any cutting, and some even go so far as to trace the letters with a steel point to avoid rubbing them off during operation. This seems to me all unnecessary on work of class now under consideration, and not only unnecessary, but unwise, and the time required to do it "fooled away."

I do not deem it necessary for an engraver to even touch the surface of an article small as a watch cap.

The thumb should usually rest along the edge of the cap, not on its surface.

There are some classes of work that would require the design to be scratched on, but if it were an inscription it surely would have to be much larger than a watch cap. Neither do I believe it to be wise for the beginner to design the lines complete before he does any engraving, for many reasons, most important being the fact of the liability of his not "coming out" just as he had designed to, and after cutting the first line he may find that it appears larger or smaller than he had designed it. Any of the lines all through the inscription are liable to undergo some change from the original plan, and should any such change be made, it would perhaps necessitate other changes, all of which has a tendency to disarrange the whole inscription, and any of these changes require time, and we should study to make every move count, avoiding going back to patch up any word that we have spent sufficient time on. I am not ignorant of the fact that the work should be so accurately laid out that no change be necessary, and while this is true, I am afraid there are a few that would design an inscription on a watch cap in ten or twelve lines and as many styles of letters and not make some style, size or shape letter that would not harmonize with those in connection with it, or the spacing found to have been miscalculated, and for this reason if none other, I am prompted to disapprove the method, especially for beginners.

It can be done correctly, but one sufficiently skilled to make a design so perfect would not spend the time to do it. The mode of procedure that appears to me best for watch cap inscriptions, is for illustration, using

the above inscription, to first, after lines horizontal and perpendicular have been drawn inside circle, to space down by making one dot for each line on the perpendicular guide line for the several lines, allowing the correct height for each style of letters. Having done this we would arrange the lines as shown at Plate 43 only making the guide lines for one line of lettering until said line is engraved. Now design and engrave the name on line DD, next draw a horizontal line at top of the capitals just engraved, for a guide in calipering oval line, (if it has to be erased), then with compasses draw two guide lines CC, for the words to go between those engraved, we next design and engrave the other lines in their order. Should, however the inscription be one where two names were used, we would engrave the second name after the first name, skipping the lines of less consequence, leaving the space for them. The idea of engraving the name first is that it being the important line we engrave it in style and size appropriate for article and space, having first, as above mentioned, spaced off by dotted lines or one dot for each line the positions for the other lines. Now we engrave the other lines appropriate to and in harmony with the important line first cut. By this method it is impossible to make errors; we build the work up as we go along and can see how it appears. Complete one line after the other, thus avoiding doing anything over. I again disagree with engravers who think it best to cut all the down and up strokes on one line before any one letter is complete; as before stated I believe it best to cut all the down strokes in one word, then all the up strokes, after which cut the hair lines to complete the word before passing to the next. The work is so quickly

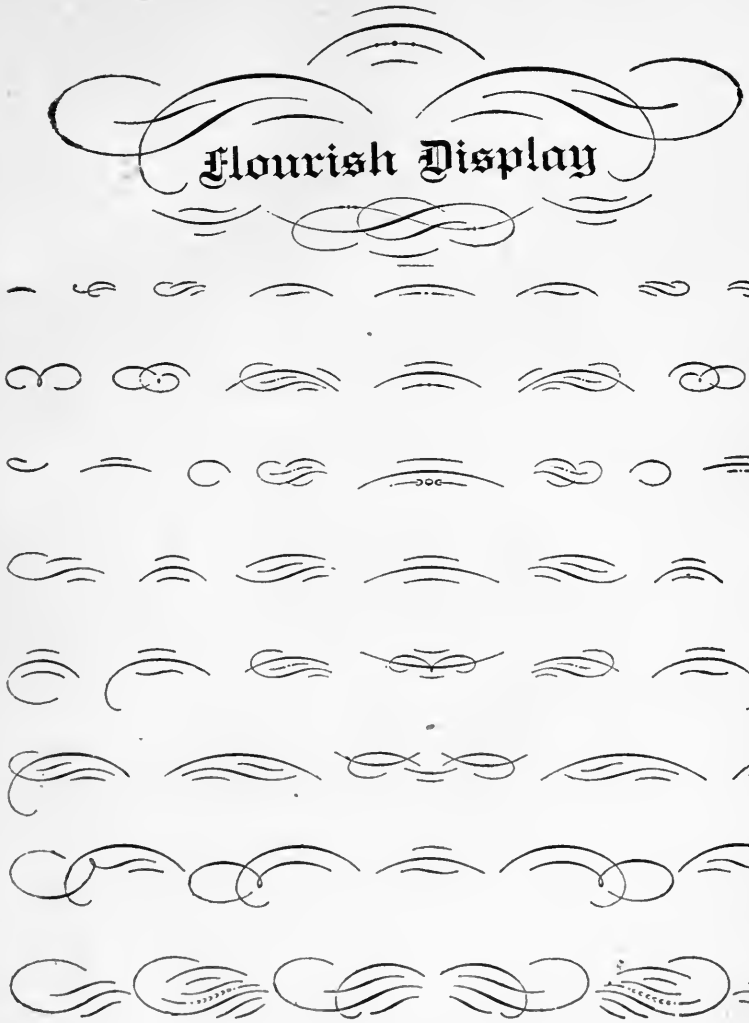


Plate 44.

turned that I am of the opinion we do not lose much time and are less apt to make errors by completing one thing before passing to another; especially is this true in fine work.

After the lettering is all complete a few flourishes can be thrown gracefully around the various lines, adding much to the general appearance. These scrolls or lines should be engraved very fine and only a few used. At Plate 44 we illustrate a few ideas of such work. Beginners usually overdo this work by crowding in too much so called "fancy work" or flourishes.

In the inscription we have here formed we have followed a very common and simple idea of the lines; they can be engraved in scroll shape in many forms and in various other styles which the student can easily use after he has accomplished the primary forms. Study fine inscription work when you have an opportunity; we can always learn something by carefully studying a finely engraved inscription, there are so many ideas exemplified in their execution.

Usually the prominent line in inscription work is engraved in Old English, German text, or script; short lines like, Presented to, From his, By her, From, and, &c., are engraved in gothic or Roman letters; italics are sometimes used.

After we have completed the lettering we now can embellish the inscription by engraving some of the flourishes above mentioned and shown at Plate 44, selecting those appropriate for space to be filled. The cap is now removed from block and wax as described in Chapter XV.

Should we desire the rich gold color lines such as seen on Swiss watch caps of the higher grade, we color

the cap Etruscan color by acid or electro gold plating it very lightly. The engraving having been done with an unpolished graver, the incisions are consequently slightly rough and the gold will adhere to such lines more effectively in same time than the polished surface of the cap. It is apparent therefore that when the lines are nicely colored the surface is only slightly colored and same is easily polished off; we now have the letters as colored, while the surface is highly polished. Polishing should be done very carefully. A very beautiful effect is obtained on the polished surface by using an unpolished graver without the coloring as above mentioned. The coloring, of course, adds to the contrast.

CHAPTER XXVI.

If we consult our dictionary to learn the correct name of letters interwoven, we will find that a cipher is "A combination or interweaving of two or more letters, especially the initials of a name," while the word monogram is defined as "A cipher composed of two or more letters arranged or interwoven in such a manner as to form a single object." It would therefore appear from the above that script letters interwoven should be given the appelation cipher, unless they are woven together very compact, while fancy block letters, owing to their appearance when interwoven, should be monograms. However, script letters interwoven are known in the trade as either ciphers or script monograms (designating styles of script), and fancy block letters interwoven are known as monograms.

Under this head we will first consider ciphers, or script monograms, in their various styles and positions. Probably the greatest mistake made by those who are not familiar with this work is that they, lacking the experience, can not see (imaginary vision) how the letters should be entwined, so they make the first letter in nearly the regular form, and try to entwine the second, and so on with the third; this is a mistake. We should make the body line of the first letter in position and form as we think it should be; now stop, study and consider the other letters. Ask yourself where and how the other letters properly entwined to avoid confusion (several bars running close together) will effect the formation of this, the first letter. Now make a portion of second letter before finishing first, and so on with the

third. For illustration we will take the three letters shown in cipher, or plain script monogram, at Fig. 6, Plate 45. These letters, several engravers have told me, troubled them to entwine and maintain harmony throughout; for this reason we will use them here. Please note Plate 46. We are supposing that it is

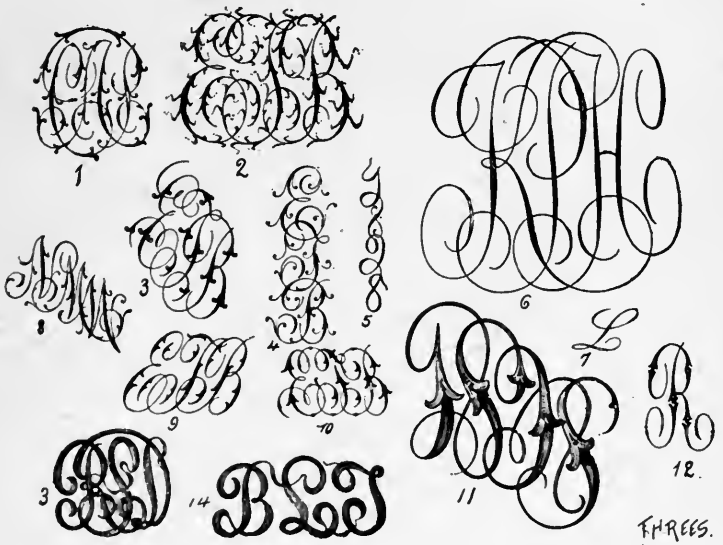


Plate 45.

necessary to engrave this monogram in a circle. We first make circle guide line with compass. Now the line of beauty is sketched in position so as to leave room for body or main strokes of the other two letters, with sufficient space for curves of all three. It is, of course, understood that there can be no set rules to go by in making these first sketches. We have the circle for one guide, also the horizontal and vertical lines, the latter

crossing former give us the center. This is the only guide we have, in fact we need none other; the eye must direct us with the aid of guides mentioned. We next sketch the lines at the right of the line of beauty, which gives us the position for placing the line of beauty of letter P. That line is now made, then the sketch lines for right of top part of said letter, which guards against our placing line of beauty of the H too close to P. Now we sketch the line of beauty of the letter H. At same time we are

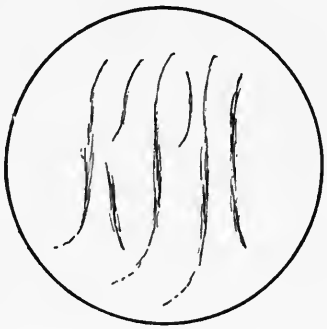


Plate 46.

making all these lines we are to keep our eye on where we can "throw" the loops of the letters. Next we make the second down stroke of letter H. Now, if you find by these rough sketches that your cipher is in center of circle, you then proceed to sketch the loops and finish up the letters. By this method of making a part of one letter, then a part of the next, weaving them together as they are being "made up," making one to fit in with the other, surely makes cipher work easy. The eye should be educated to see imaginary lines of the different letters, an accomplishment easily acquired

by a little study of cipher work and practice designing same. Having sketched the cipher as perfectly as you can, making necessary changes by "patting" the finger on the imperfect part, which will, by the aid of the wax through which the designing is done, erase the original sketch, then sketch the imperfect part again correctly. You are now ready to do the engraving.

Some engravers advise cutting the heavy bars of all the letters first, then go back to the first letter and complete it by cutting all the loops and connecting lines, treating the other letters likewise. This may be an advisable method to follow, but I do not agree with those of that opinion, for reasons I have mentioned heretofore in connection with lettering. The method last mentioned would, perhaps, be satisfactory to the expert, but would be an unwise mode of procedure for a beginner.

For illustration in engraving the cipher at Fig. 6, we would first engrave the line of beauty of the letter K, beginning at end of loop, thus engraving the loop first, and so on up the beauty line, which line it will be remembered we have stated before should be cut up only. We continue letter K until completed. Now we arrive at the point of showing the advisability of engraving one letter at a time. Should we find that after cutting the letter K that the next letter was a little too far away, or too close, we could remedy the error by not changing the sketching, but by, when engraving the letter, running the graver a little to the right or left of sketch line. And so on with letter following. Those who may not agree with me, would say your design should be perfect. True, it should be practically so; and I am supposing it to be, but it will be conceded that

designs sketched are not perfect; even when engraved we will find imperfections, and surely we can engrave more accurately than we can sketch. Again, when we designed the cipher we made the bars as we thought they should be. Now, if when we engrave the first one we find it would be better to make them all a little heavier or lighter, using first bar cut for sample, the necessary changes could be made from original idea of their width. While if all of the heavy bars were cut first, and we then found they were too heavy or light, we would need to make some changes in other portions of the letters to maintain the harmony desired, and this could not be done without designing them over again or doing a large amount of guess work, a thing a good engraver should never do.

In conclusion on this subject I would say that if we cut all the beauty lines and heavy bars first and any change has been made from the design, it would be difficult, especially for all except an expert engraver, to now connect the loops at the end of lines of beauty with said line. It would be difficult to make a perfect connection should we follow the design perfectly. While in the method of one letter at a time we begin at the end of line, forming loop at end of the line of beauty, therefore there is no connecting to be done, because we begin at one end and continue to the other, of course allowing the throwing out of graver at places where it should be done.

Having engraved the letter K, we next engrave the letter P in same manner and so on with the next letter; be extremely cautious to cut the main strokes of all the letters same width, unless the design is one where the first and last letters are some smaller than the middle one

in order to make the cipher within a circle, in which case the smaller letters should be made a very little heavier if it can be done and maintain the uniform appearance of the cipher throughout. It will be noticed that the top and bottom loops in the cipher under consideration swell up and down in the center, that the beauty line of the letter K is shorter than the bars, loops forming the left of the letter and that the letter H is the reverse. This is done to make the cipher round.

As this cipher now appears at Fig. 6, it is ready for any style of embellishment we may wish to add. The cipher is complete as it is, for a plain "script monogram;" however, if it were cut with the intention of being left plain, it would be well to engrave it a very little heavier, it depending, to some extent, upon the article and style of article being engraved.

The style of ornamentation used to embellish cipher shown at Fig. 1, could be added to cipher Fig. 6 very effectively; perhaps more appropriately than style shown at Fig. 2, owing to the fact that the letters are more closely entwined than at Fig. 2. If this style were used it would be necessary to lessen the number of little cuts constituting the embellishment. The ornaments shown at Fig. 1 (cipher) are made with the square graver, starting on the lines of the letters with a hair line and gradually turning graver as you near the end at which point the graver is thrown out as in making a lower case script letter E or C.

The round dots on the hair lines are made with a half round graver, with the exception of similar dots at Fig. 4 and 12 and ornate cuts on cipher Fig. 10, all the work on this plate is executed with the square graver.

The ornate cuts on cipher Figs. 10 and 11 are cut with

a flat bottom graver, using one point cutting to right and the other cutting to the left.

The styles shown on this plate are all suitable for such pieces of silver as teaspoons, forks, and all small silver novelties.

The hanging figures shown at Fig. 5 are often used on the back of spoons and forks when the space is very narrow. Initials entwined in same style could be used for lettering front of spoon where space is narrow. Style shown at Fig. 4 is used for same purpose. The other styles here shown are designed to show a few of the various ways script letters can be used. The style for us to select depends largely upon shape and size of space to be lettered. Plate 47 will give some idea of lettering spoons or forks, showing letter or letters selected, made in style appropriate for design to be engraved.

Plate 47.

It is one of the important duties of an engraver to select styles of lettering suitable for article he is to engrave, and it is a duty upon which he should study and deliberate sufficiently to warrant a wise decision, while on the other hand, should he hastily begin the work, not considering form, style or quality of article in hand, he would probably be dissatisfied with the appearance of the work when finished. It would be unwise to engrave cheap work on fine goods or vice versa.

CHAPTER XXVII.

The figures 1898, entwined diagonally, at Fig. 11, Plate 45, are large enough and suitable in style of cutting for a fine silver match box or any article of same size. Parallel line filling (the filling lines running parallel with the formation lines) is very popular, is not easy to execute accurately, and is very handsome when done neatly. It may be for reasons above that this style of cipher, or, as generally termed, "fine line script monogram" work is used by our best jewelers so extensively. The cipher of figures at Fig. 11 is engraved as referred to above, except the work here shown is broken in center of shade of each bar by a leaf-like ornament protruding to the right and left. This style of cipher can be engraved cheaply by making less lines or heavier. If engraved bright cut, the flat bottom graver is used in cutting the shading lines; if engraved on polished metal, the square tool only is used and the shading is executed by parallel lines cut so closely together that the surface between each is entirely cut out, thus effecting a shade.

Ribbon work, a style that has been used very extensively for the last few years and is as yet in great demand, is engraved in general as described for "fine line cipher" work. In short, all there is to ribbon work is parallel lines. The letters should be made after the script style, not discriminating prominently between hair line and shade portions of letters. The letters are made nearly same width from beginning to the end of the general form of the letter, the hair line portions acting only as connecting lines, or showing where the sup-

posed ribbon has turned, and edge only of same being visible. The illustrations here shown are not specimens of high grade work in this style, and are small, but will suffice to show the reader how the work is executed. The initials Fig. 14 are used very commonly for oblong trays and similar pieces; connecting the letters as we have in our illustration adds to the effect of the ribbon.

Ribbon work is engraved in many styles too numerous to mention here. One very effective style is to twist the supposed ribbon in center of shade of each bar of the letters. The work is done by engraving that portion as you would a rope; see an illustration of a rope should you care to engrave such style. I will say, however, that the plain ribbon is very rich and would be hard to improve. The work shown in our illustration is shaded, same being done as described for style shown at Fig. 11. All ribbon work is not shaded, it being a matter left to the discretion of the engraver; some do, some do not; generally, I think, shading adds to the appearance of the letters.

The effect of ribbon work can be made by one bright cut on satin finish silver, using the flat bottom graver, cutting a heavy bright cut width of the bars or limbs of the letters. The design of the letter largely produces the effect, and here is where we should spend a great deal of time and study. After you once get the correct idea of these letters, you will say with many others, "they are easy."

Study odd forms of letters and avoid following the perfect script style, but use the general form of same in ribbon lettering.

Fine line script or ribbon work is engraved with the square graver. Taking line of beauty of the letter B,

Fig. 14, for illustration, we begin at the end of the said line, or where the heavy line turns to hair line, crossing line of beauty. Note Fig. 1, Plate 48. We begin at A, cutting a shade cut (or several cuts to make shade, it depending upon class of work in hand) down to B, from which point the line is continued a hair line, the width of same depending upon size of letter being engraved. It will be noticed that the cut from A to B is the line to the right of that portion of the letter, while from B to C it is the left line. The work is continued

Plate 48.

by going back to A and cutting all other lines the same as first, except, of course, the lines after first one from A to B are not shaded. The last line is engraved around to B; it is cut heavier from that point to C to make the shade, which, if the work in hand is on silver, and being engraved bright cut, is cut with flat bottom tool by using right corner of cutting edge and shading on the line of beauty.

It will be readily understood by this method that after the first line to one side of any portion of a letter is cut all we have to do is to cut the other lines parallel with it, excepting when the line begins at a point on hair line

and ends the same, in which case the lines as coming out from or running into said finer lines, must necessarily be engraved closer together gradually. In other words, the work is carried to completion by cutting one line after the other, always cutting to the right of line first cut.

One important point favorable for effective work and in fact which should be studied with care and followed accordingly, is that the end of no line should be visible.

The lines should begin from a given point and swell out to widen the letter where required, and then run closer together where letter is more narrow, and should said lines be carried to a fine line they should all run in one line, the end of no one line being noticeable. Notice termination of lines at C, Fig. 1. Fine line script work is engraved from the same general idea; where a hair line should be we only cut one line and where the shades are several are engraved, swelling out from the hair line and then in again, thus making shade of fine lines running very close together, gracefully swelling out from a fine line and in same manner. Ribbon letters can be formed in cipher style of the various ideas of positions shown on Plate 45. Ribbon letters should never be ornamented by ornate cuts as on the other ciphers shown on this plate. Fine line ciphers are often ornamented by making the little cuts with square graver as shown at Fig. 2, Plate 45.

There is another style of fine line work formed similar to the ribbon style and is engraved in the same manner. We will show specimens of this style in another chapter.

Noting Figs. 2 and 3, Plate 48, we have here two designs of two letter ciphers designed for a space when

the same is smaller at top. The designs are so far from those commonly used that they are worthy of some study. The peculiar manner in which the loop at the bottom and left of letter D, Fig. 2, is made to balance the lower portion of the letter E on opposite side, brings to the student ideas of art in cipher work which he should study. The style of ornament used to embellish these letters is in outline or reality what we

Fig. 1.

Fig. 2

Plate 49.

endeavored to imitate at top and bottom of cipher Fig. 1, Plate 45.

The manner in which the lower end of the line of beauty of letter R, Fig. 3, ends to harmonize with, and balance lower loop of same letter on opposite side is an idea worthy of notice; also the graceful way in which the lower portion of the letter D drops down to harmonize with top of letter R. These few ideas show to the student some of the characteristics of script monogram work, and as previously stated, should be studied and practiced by designing over and over again any letters you may select to entwine, until the artistic merits of same are produced.

At Plate 49, we show a style of cipher that is generally considered a very neat and showy style; it is a style that can be engraved cheap or expensive. As here shown it is supposed to be cut bright. Letters of this size call into use the flat bottom tool for engraving the shades. They can be engraved with the square graver, but the flat bottom tool is better for work of this size. The ornate cuts connected with this monogram are a little out of the regular line of style of embellishments, but they are easy to execute and present a favorable appearance when done well. At Fig. 2 we show an enlarged drawing of the ornament referred to. The cut A is first engraved with the flat tool if engraved large, and with square one if engraved small. The cut B is next engraved, shading over toward the first cut; the finer line C is next cut, beginning at end and cutting around to cut B. The dots that appear scattered around on this cipher are made with the half round graver. Engravers are expected to engrave letter seals; many good engravers do not, however, for reasons I have never been able to learn; it surely is easily done and we should be able to do it. The mode of proceedure is to coat the seal with wax made of one part Burgundy pitch, one part Canada balsam, and two parts white wax. These parts are thoroughly mixed together, put into a bottle, perhaps one ounce size or larger, but that amount would last a long time.

When cool the wax will be hard, and could only be applied to seal by heating latter. As that would take time we obviate the necessity of that extra work by dissolving the wax by pouring a tablespoonful of benzine on the wax, which will gradually work its way down through the wax, making it pliable and soft enough to

be applied to the seal by taking a small amount from bottle on point of a knife and coating it over seal with index finger. The bottle should be air tight; do not leave cork out. Should the amount of benzine mentioned be inadequate to dissolve wax, add more, it may require several days to do its work.

We now place the seal on a piece of paper, and with a pencil mark around it, making a delineation on paper of size of seal; the desired letter or monogram is now sketched with a pencil on the paper within the delineation made. With a pair of scissors we cut around the line outside cipher or letter which line is same size as seal. Now we lay this piece of paper on the seal and burnish it carefully all over, then with the point of a knife peel the paper off, leaving a very plain impression of the drawing on the seal. Now scratch the design on very accurately with steel pointed marker, after which remove the wax with alcohol, leaving a reverse design of sketch on seal. You are now ready to do the engraving, which should be done heavy and deep. A little practice is all that is required to engrave silver seals (such as are sold by jewelers).

CHAPTER XXVIII.

Our pen sketch etching of the letters E S C shown at Fig. 1, Plate 50, is a style of cipher or script monogram work that contains many elements of art when well executed. In this work the engraver brings the letters out with only the square graver on a flat surface

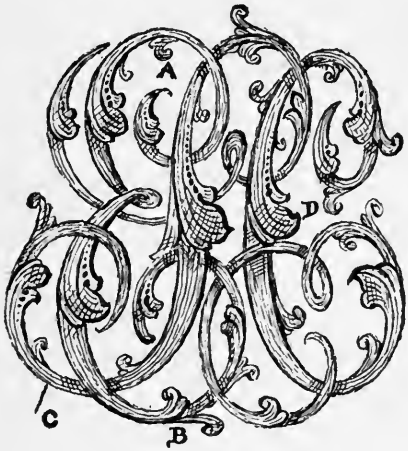


Fig. 1.

Fig. 2.

Fig. 3.

Plate 50.

with a prominence due each one, with leaves and portions of them laying on and protruding from the various curves and limbs of the letters. The fact of this work all being done with one graver, making only lines and producing the effect of bas-relief work by such lines requires some artistic skill. This class of script monogram work is very commonly used by our best en-

gravers. In executing this work the design is first roughly sketched as a plain cipher. It is now touched up (corrected) until the design is as near perfect as we are able to make it. When first sketching the outlines we give the letters a very little more freedom than would be allowed were the letters not to be embellished, thus leaving ample room or space for the leaves and ornate portions to be added.

After having perfected the design in outline, we next design the leaves on in their respective locations; of course, we design right over that portion of the letter directly underneath the leaves, but as the first designing is done very lightly, it is an easy matter to make the leaves and portions of same prominent by making the second designing a very little heavier; then, too, the fact of the leaf ornament slightly curving as the end is reached, permits the lines of design to cross those first made, another point allowing prominence to leaf sketch.

Such ornate portions as shown at A and C are not designed at this time; they are not considered until the letters are all engraved, after which such cuts as above mentioned are designed and engraved. An engraver of experience does not design such embellishments; he fills them in by his eye, cutting them wherever his artistic ability dictates.

Having designed the leaves on—it is to be understood that in designing the leaves only the outlines are made, the fine line work between the delineations is all engraved, using only the eye for guide—we now, providing the monogram is to be a fine one, carefully go all over the outlines of the completed designed letters with a steel pointed marker (reference to which has been made before, and described) cautiously and

lightly scratching such lines as are to be engraved. Having completed this work, the wax through which the original design was made is wiped off, leaving a perfectly (should be practically perfect) outlined design.

I have said in a previous chapter that designs should not be scratched on metal for engraving, but I excepted work of this kind. The cipher here being considered is one of such size and style that would justify one in following the method described above. Should we design the letters to be engraved cheaply, we probably would not take time to scratch it on, but for fine work by so doing we surely have a clearer surface to work on, and perhaps a more perfect design.

If we were engraving this cipher or flower leaf monogram on satin finish silver, the dots shown prominently in our illustration would be made with a half round graver and the shading at end of leaves would be done with flat bottom graver. The lines in this illustration appear broken, the etching being made from a pen sketch; but the lines should not be broken, as will be shown by other illustrations made from an engraving. The lines should run from a given point or portion of the letters to another, spreading out and running in closer together as the case may be, and by such accuracy only is the effect obtained.

The reader will note the peculiar manner in which these letters are interwoven, especially the letter S, the angle of which is changed decidedly from that of the E and C; it will also be noticed that by "throwing" the S in, or weaving it in with the other letters in this way, that the letters are all tied together in such manner as to allow perfect freedom and gain harmony throughout; the result of which is a monogram of artistic elements,

producing in general a beautiful effect. The student will also please note the continuation of the lower loop of the letter C, how we have "thrown" it back to the left, "hooking" or looping it in the letter E. An extra or continued loop of this description is often used to advantage, but caution should be exercised as to their use, only using them when needed for such purposes, as we have in this case.

Engraving on aluminum is very common, so many articles having been made of this metal the past few years. Those who have attempted to cut aluminum with no knowledge of it will appreciate the fact of it being quite difficult to engrave on. Those pieces of toilet ware that are engraved in the factory are cut as bright as engraving could be on satin finished silver. The gray finish usually put on aluminum articles produces a most attractive appearance when engraved bright cut. The only secret connected with this work is that the highly polished graver is dipped in a liquid made as follows: Oil of turpentine 4 parts, stearine 1 part, and 1 part rum. This liquid is put in a bottle with a large neck to enable dipping the graver in it, and should be corked tight when not being used. If we were engraving a large monogram, the surface of the metal could be smeared with the liquid. Another method employed by the writer is to put a little cotton in a small tin box, then put a few drops of the liquid on the cotton. The object of this is that dipping the graver in on the cotton in a shallow tin box, as mentioned, is easier than the bottle, and the cotton merely being dampened, we do not get a superfluous amount of the liquid on the graver point. The formula mentioned is also very useful for engraving very hard metals, such as plated spoons and forks.

Engravers are often asked to do etching, especially in bowls of spoons. To do such work we paint the letters in the bowl with a very fine camel's hair brush, using asphaltum varnish. Now paint the spoon bowl where the acid is not wanted to act. Usually a border irregularly designed about a quarter of an inch inside the edge of the bowl is used. It is a good plan to paint the back of the bowl to avoid danger of any acid touching it, then too, when this is done, the entire bowl can be dipped in the acid; in the other case the acid is only put in the bowl. The acid should be kept in a bottle with a glass stopper. The etching acid is made as follows: Four parts of water to one part of nitric acid. If more acid than this is added the resist coating of varnish would be liable to slough off. Heating will menace the rapidity of the action of the acid; but much heat will also cause the resist varnish to slough.

Should we have a gold plated bowl to etch, we would have to use a mixture of three parts of muriatic and one part nitric acid, diluted with five parts water to remove the gold, after which the acid mentioned above is used for etching deeper down in the silver. After the acid has eaten in deep enough the varnish is removed by turpentine. The letters will be in relief, and the part of the bowl that came in contact with the acid will appear gray, thus making the letters very prominent.

At Fig. 2, we illustrate a figure monogram 1897 This style of monogram is engraved so much like the cipher mentioned in this chapter, that it is not necessary to direct the student further. The figures are first designed plain, as with the cipher above referred to, then the leaf-like ornaments are designed. The filling in the center of the shades of the figures can be made in var

ious ways; the one here shown produces the best effect with the least work. A rubber stamp liner can be made for fifty or sixty cents that will stamp thirty or forty lines to the inch on the monogram, thus enabling the student to engrave all the lines parallel and horizontal. A line stamp of this kind is very useful in block monogram work. They are easily made by any rubber stamp maker or wood engraver. It is first necessary to make a wood cut from which to make the stamp.

At Fig. 3 we illustrate a rustic monogram. The monogram is engraved complete with the square graver, it requiring only hair lines to produce the effect here shown. This work can be executed in a cheaper way by wriggling with a fine liner along the edge of the letters instead of the parallel and cross lines.

CHAPTER XXIX.

Fancy block monograms are not as commonly used now as they were a few years ago, but we should know how to engrave them, and how to go about it in a manner becoming a workman. The circle, perpendicular and horizontal lines illustrated in Chapter 24, to be used as guides in forming an inscription, is the method employed to assure an accurate block monogram design. We here have the center of the circle which would be the center of a watch case, if we are engraving the monogram on a case, we have the perpendicular line as a guide to follow for making the letters perpendicular, the horizontal line to assure the portions of letters formed horizontally to be at right angles with the perpendicular bars. Then we have the circle through to which each letter should run, if it can be made to do so effectively, as shown in our illustration of H S B in center of Plate 51. Of course all fancy block monograms are not made as "stiff" as this one, but the guide lines mentioned are useful in any case. The filling for block monograms is a valuable consideration. Space will not permit our illustrating many. We have here shown the bead work, parallel and cross lines, which with dots made with a half round graver are the most common filling used, the reason for which is probably due to their being the most effective. There are many fillings finer and much harder to execute than the bead work, but as it is difficult to illustrate such work by black on white (press printing) we will pass others. To execute the monogram as here illustrated (H S B) we first design it in outline, first sketch-

ing the prominent or last letter. Next we consider the other two, usually making the first letter, after which the middle letter is woven in with the other two. There are many good letter engravers that are not good monogram engravers. There is a broad scope for study and development in this class of work. After having per-

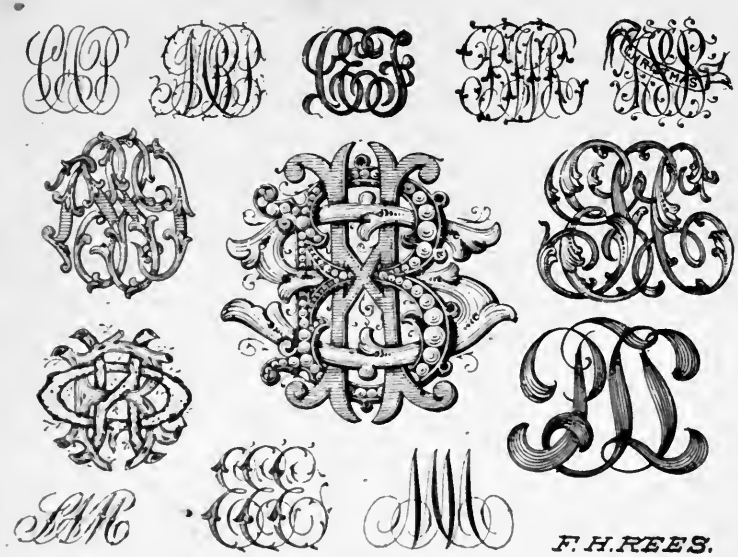


Plate 51.

fected the design by sketching it quite plain, we add the little ornaments such as protrude from the letter S. The sketch would now appear as shown at Fig. 1, Plate 52. I assume that it is unnecessary for me to state that the filling and small fine ornaments are not designed. All the designing we do is to make the outlines of the letters.

Assuming we are to engrave this monogram on a polished gold watch case, we could engrave the monogram complete with a square graver, and would not need any other unless it were a flat bottom graver, to cut the little notches partially between the beads on the letter B. Having completed the design as above described, we can now engrave it, or we may carefully scratch the perfected sketch on the case with our steel point, then wipe the wax (transfer wax, which is used to design through on polished metal) off, leaving a very clear and accurate outline on the clear surface of the metal. We now engrave the outlines of all the letters, allowing space for shades, after which we begin with the letter B and shade it. The shading on this letter was executed in our plate engraving of same by cross lines cut on an angle of 45 degrees from left down to right, beginning inside the outline first cut, just the width of shade we desire to cut, and cut down and into the outline mentioned. We begin these lines very fine and cut deeper as the graver is pushed forward into the outline. It will be understood, therefore, that these little cuts, which are to be made as close together as is possible (or practicable) are dove-tail shape, they being very close together, of this shape, and beginning on the metal's surface, and going deeper and deeper until they run into the outline first cut, forming the letter. It is plainly to be seen that such shading will give to the letter an appearance of relief, and I think it is safe to say that this is one of the most effective and finest styles of shading. I regret our etching does not show the work as above described, but I trust from the description above that the reader will well understand how the work should appear. Fig. 2 illustrates the monogram as it would appear after the B

and H were shaded. After cutting the shading on this letter, we cut a fine line along the beginning of the lines constituting said shading. This done, we engrave another fine line inside this one. The distance that these lines are cut apart will be understood by referring to the letter B in the center of Plate 51. The width as here shown is the width of the white line just inside shade of said letter. Now we cut a similar line inside the line first cut on the other side of the bar of the letter, they being same distance apart, as the ones on the other side.

Plate 52.

We are now ready to cut the filling, which in this case being beads, we first engrave the outline of the little beads by cutting a small circle, just filling up the space between the inner hair lines. After we have gone all over the letter and engraved these little circles, we take the flat bottom tool and notch out between the beads, cutting both ways when necessary. The square graver could be used for this purpose, but the flat tool could be used more expeditiously. The notching out completed, the fine lines as shown inside the circle are cut, the same acting as shade lines producing the effect of beads. The letter H is shaded by cutting parallel line with square

graver, the same being engraved so close together that the metal's surface is entirely cut out. The fine lines, as shown in our illustration, are next cut, after which the parallel cross lines are engraved. The rubber stamp mentioned in the previous chapter can be used to aid the untrained eye to make these lines accurately. The letter S is shaded same as the letter H. Fig. 3 illustrates the appearance of the monogram cut in outline and shaded. The fine lines running along edge of the letter are cut next, completing the letter. A few fine lines are cut on each bar of the letters that go under another letter. This done, the little curves of fine lines in and around each of the letters are engraved, the number, style and location of same being a matter of discretion on the part of the engraver. The monogram is now complete and ready for polishing.

The monograms shown around the monogram we have above considered are some of the styles mostly used, all of which we have described.

Should we have occasion to engrave the monogram H S B bright cut the fine line shading we have mentioned would be exchanged for bright cut shade method of cutting, same having been described in former chapters. Block monograms are often engraved oblong in lieu of round and square, and when so engraved we make our design by the aid of guide lines mentioned, but sketch an oblong loop for guide in lieu of circle in case of round monogram.

The monogram student can learn a great deal by studying specimens of monogram work that may come to his notice, and when ever he can he should get an impression of good specimens by taking an impression with ink. Printers ink rubbed in the incisions, wiping

the surface off clean with palm of the hand or a piece of cloth will make a good impression by the same method we have described for taking an impression from one spoon to others. The ink impression can be printed on a piece of paper, the first impression would be the reverse of the original, but an impression from the impression on another piece of paper will print the monogram correctly.

CHAPTER XXX.

Figs. 1 and 2, Plate 53, etchings made from a steel plate engraving, illustrate two styles of flower leaf monograms. Fig. 1 we consider one of the most elaborate styles of cipher or monogram work. Our etching does not show the culmination of art that is manifest in the original engraving, but demonstrates the artistic

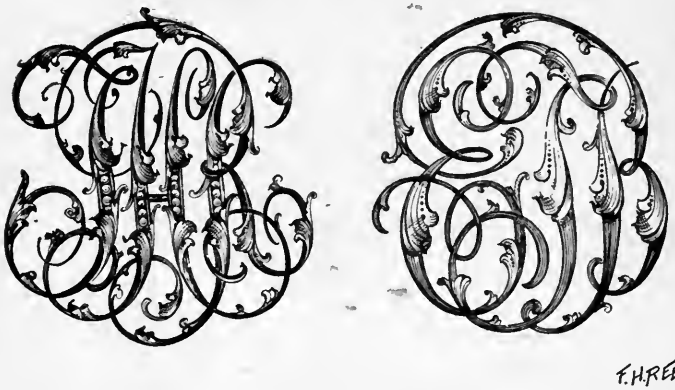


Plate 53.

elements of the original, and we will ask the reader to consider those portions of the letters that are black, fine lines, all of which are engraved so fine that in making an etching it is impossible to reproduce them so as to print separately. This monogram was engraved with the square tool and is builded entire by fine line work, even the cutting out around the bead work, in lieu of flat bottom tool as previously described for that work the square graver is used cutting several lines dove tail shape, beginning at point

where the beads join and cut out to the inner line of the bar. The appearance of cuts thus executed having been elucidated in a former chapter, the reader will by calling his powers of comprehension into activity note the fact that lines engraved in this manner would be conducive of relief work and in accrument with the raised appearance of beads culminate ideas of that which is possible in line engraving. The apparent protuberance of the bead work would indicate an impossibility of so arranging the leaf embellishments above and below said bead work so as to throw the prominence of same back, yet it is true, and while our etching does not show the bead embellishment embossed as the engraving of the same on metal would make it appear to be, yet the reader will comprehend from explanation, that the same is true and will note the protuberance of the central leaf work over the bead embellishment. For these reasons of optical illusions so prominent, and at same time the letters and every portion of them being even with the metal surface, the work being executed with lines only, and maintaining that harmony consistent with a very readable monogram, prompt us to say that in such work, in our humble opinion, we can produce one of the most beautiful monograms, and for this reason we close these chapters of "Modern Letter Engraving" with this class of work.

In one of the early chapters we illustrated one of the modern engraving blocks. The well known "Lancaster" engraving block being similar, we deem it unnecessary to illustrate it. The Lancaster is one of the best blocks made; the writer has used one for a number of years and takes pleasure in speaking of its merits.

Fig. 2 illustrates a style of leaf embellished monogram much plainer than Fig. 1, with much less work. Yet it is formed after the style of Fig. 1 and is appropriate for engraving expensive pieces of silver, and would please some customers more than Fig. 1.

Monograms of this style require some study and practice of technical application of fine lines, and a student aspiring to master the art should remember that our best engravers have accomplished their skill by hard and studious work. Many skilled engravers have studied many other branches of technical and chemical work in order to excel, and any young man that devotes sufficient time and study to master the art of engraving will find that his services are in demand and will be well paid for. This day and age we are required to meet the strongest competition and are expected to execute work of the highest grade, our customers having been educated so thoroughly in work of art that engraving of today must be executed dexterously.

Good Lacquer.
Spirits of Wine to which
a little collodion is added

ENGRAVING PAD.—Will you please publish a few formulae for making a paste or pad with which I can transfer engraving accurately? I have been using a regular pad also a transferoyd paste with good results, but would like to make some myself. In doing the work I use Chinese white and printers' ink.

Buy some printers'-roll gelatine from a newspaper office. Put some water into a kettle, bring to a boil and set in it a can containing the lumps of gelatine. When the latter is melted, pour it into a tin box which will mould it into a slab of size about 3 by 6 inches or a little smaller, and ½-inch thick.

After the gelatine has cooled, the transfer pad may be taken out of the box and is ready for use.

Take the engraving which is to be copied, rub powdered whiting into the cuts and wipe off the surplus; press the engraving down on the transfer pad, then remove it and on the pad will be left the form of the engraving, where the whiting was deposited from the engraving. Take the piece which is to be engraved, dab on it a film of tallow, and press it down on the transfer pad, over the whiting design. This will imprint the design on the piece, and several impressions can be made from each whiting transfer.

This is the method which we suggest as probably the easiest and simplest.

Recipes for Repair of Celluloid Work

CELLULOID CEMENTS.—I.—To mend broken draughting triangles and other celluloid articles, use three parts alcohol and four parts ether mixed together and applied to the fracture with a brush until the edges become warm. The edges are then stuck together, and left to dry for at least twenty-four hours.

II.—Camphor, one part; alcohol, four parts. Dissolve and add equal quantity (by weight) of shellac to this solution.

III.—If firmness is desired in putting celluloid on wood, tin, etc., the following gluing agent is recommended, viz.: A compound of two parts shellac, three parts spirit of camphor, and four parts strong alcohol.

IV.—
Shellac	2 ounces
Spirits of camphor	2 ounces
Alcohol, 90 per cent	6 to 8 ounces

V.—Make a moderately strong glue or solution of gelatin. In a dark place or a dark room mix with the above a small amount of concentrated solution of potassium dichromate. Coat the back of the label, which must be clean, with a thin layer of the mixture. Strongly press the label against the bottle and keep the two in close contact by tieing with twine or otherwise. Expose to sunlight for some hours; this causes the cement to be insoluble even in hot water.

VI.—
Lime	av. oz. 1
White of egg	av. oz. 2½
Plaster of Paris	av. oz. 5½
Water	fl. oz. 1

Reduce the lime to a fine powder; mix it with the white of egg by trituration, forming a uniform paste. Dilute with water, rapidly incorporate the plaster of Paris, and use the cement immediately. The surfaces to be cemented must first be moistened with water so that the cement will readily adhere. The pieces must be firmly pressed together and kept in this position for about twelve hours.

CEMENTING CELLULOID AND HARD-RUBBER ARTICLES.—I.—Celluloid articles can be mended by making a mixture composed of three parts of alcohol and four parts of ether. This mixture should be kept in a well-corked bottle, and when celluloid articles are to be mended, the broken surfaces are painted over with the alcohol and ether mixture until the surfaces soften: then press together and bind and allow to dry for at least twenty-four hours.

II.—Dissolve one part of gum camphor in four parts of alcohol; dissolve an equal weight of shellac in such strong camphor solution. The cement is applied warm and the parts united must not be disturbed until the cement is hard. Hard-rubber articles are never mended to form a strong joint.

III.—Melt together equal parts of gutta percha

Re-Finish Gun Metal

Remove the old finish by boiling in a solution of nine parts water and one part sulphuric acid. Be sure and remove all pearls or stone settings before doing this. Prepare for the gun-metal dip by scratch-brushing with fine pumice and water; rinse in hot water, and string the article on a copper wire, then hang into a solution of 12 dwts. acetate of lead, in a porcelain dish, and 12 dwts. of hydrosulphite of soda. Each of these ingredients must have been previously dissolved in a half pint of water, then poured together and warmed. Bring this to a boil, remove the work once or twice, scratch brushing each time. When the piece reaches a bluish appearance wipe dry and hold over an alcohol lamp to dry out. Keep the article with a cloth which is moistened with boiled linseed oil. Wipe, or brush off, until nearly dry, then place in a heated oven until a velvety black appears. Let cool, place for a little while in linseed oil, remove and wipe off.

Jurgens & Anderson Co.

extend best wishes for a

Happy and Prosperous New Year

Chicago

SOUTHERN REGIONAL LIBRARY FACILITY

A 001 119 259 8

Unive
So
L